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5/23/02

Planning Office  
National Park Service  
Grand Teton National Park  
PO Box 352  
Moose, WY 83012

Dear Park Service:

These are comments on the Yellowstone and Grand Teton National Parks Winter Use Plans Supplemental Environmental Impact Statement (SEIS) on behalf of the Alliance for the Wild Rockies (AWR). Our comments are intended to provide the Park Service with a clear idea of which alternative we can support and reasons why. Thank you for taking the time to review these comments. We would like to incorporate, by reference, the comments submitted by the Fund for Animals. We have reviewed these comments and received permission to incorporate them from their author, D.J. Schubert of Schubert and Associates.

The Alliance has participated in the planning process for winter use in Yellowstone and Grand Teton National Parks for nearly three years and we continue to have a keen interest in the eventual outcome. Aside from it's astounding geological and cultural qualities, the Greater Yellowstone Ecosystem is an integral part of the larger Northern Rockies bioregion, which still provides wildness and habitat for native species that the rest of the United States has lost.

The wildness of Yellowstone and Grand Teton is defined by it's aesthetic beauty, undisturbed land and water, remote and quiet setting, and absence of human development. The unique habitat is defined by clean flowing streams, high alpine rock and ice, and everything in between; these vulnerable areas still offer productive habitat to species such as the grizzly bear, bison, wolf, and moose that have been exterminated from surrounding ecosystems. It is these unique qualities and natural resources that the Park Service and the Winter Use Plan are obligated to protect. After reading the SEIS it is clear that the NPS is acutely aware of this fundamental obligation. The NPS Organic Act and numerous NPS Management Policies clearly illustrate that when presented with a conflict between resource protection and any other interest, resource conservation is to be predominant. Therefore, snowmobiling, which has been irrefutably shown to cause resource degradation and pose human health risks, must be stopped.

The reality is that any over-snow motorized use is likely to be in conflict with the preservation of Yellowstone and Grand Teton National Parks. However, given the limited scope of alternatives presented in the SEIS we have decided to endorse alternative 1a. There is nothing presented in the SEIS to indicate that resource degradation resulting from snowmobile use can be mitigated absent a complete and outright ban on public snowmobile use in the parks. There is nothing presented in the SEIS that can reasonably lead the NPS to issue a different decision than was issued in November of 2000 on this issue. For these reasons we urge the NPS to uphold your obligation to the parks and the people of the United States and adopt **Alternative 1a** from the SEIS.

Sincerely,

Ryan Shaffer

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WESTERN COLORADO CONGRESS \* WHITE RIVER CONSERVATION PROJECT

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

May 29, 2002

**RE: WINTER USE PLAN DRAFT SUPPLEMENTAL EIS for YELLOWSTONE AND  
GRAND TETON NATIONAL PARKS AND JOHN D. ROCKEFELLER JR.  
MEMORIAL PARKWAY**

To Whom It May Concern:

The Southern Rockies Forest Network (SRFN) is pleased to provide our comments in response to the Supplemental Environmental Impact Statement (SEIS) for the Winter Use Plan in Yellowstone and Grand Teton National Parks and John D. Rockefeller Jr. Memorial Parkway. SRFN is a coalition of 26 local, regional, and national conservation and recreation groups, representing tens of thousands of Americans, dedicated to protecting the last remaining wild places in the Greater Southern Rockies ecoregion. SRFN supports the National Park Service's decision to phase out snowmobiles use in the parks, and believes that this decision will help to safeguard our the parks for current and future generations to use and enjoy. We are writing in support of Alternative 1a because Yellowstone and Grand Teton deserve the best protection possible.

Americans want Yellowstone and Grand Teton to remain peaceful places in winter where bison, elk, and other wildlife are not harassed by noisy vehicles. Snowmobile use in the two parks would continue to pollute, make rangers sick, and prevent visitors from enjoying the solitude that Americans expect from their national parks. As the recently completed SEIS demonstrates, the Park Service's decision to phase out snowmobile use in the two national parks was based on the best science. That decision must remain in place because it is the only way to protect America's first national park. Please accept the following comments in response to the Winter Use Plan SEIS:

**National Park Service Primary Mandate to Protect Park Resources and Values**

The Park Service has the highest duty under governing law, regulation and policy to provide national parks with the best possible protection. The NPS mission was clearly elucidated by Congress and has been reaffirmed over the years. NPS' role is not to find management solutions that may perhaps or just barely meet legal guidelines; rather NPS has an affirmative responsibility to implement management actions that ensure full compliance, or go well beyond simple compliance, with law, regulation and policy now and into the future.

**2000 ROD and 2001 Rule Clear: Snowmobiles impair park resources and values, violate NPS duty under guiding law, regulation and policy.** Beginning more than a decade ago, the Park Service began to study the impacts of snowmobile use on park resources and values. Through comprehensive analysis during a three year NEPA process, the Park Service determined that snowmobile use in Yellowstone, Grand Teton, and John D. Rockefeller Jr. Memorial Parkway causes unacceptable damage to park resources including:

*...wildlife, air quality, and natural soundscapes and natural odors. Further, it adversely impacts the enjoyment of those values and resources by other visitors. The impact on people who may visit the three parks once or twice in a lifetime, and who seek the resources and values for which the parks were created, may be adversely and irretrievably affected. (NPS Record of Decision, November 2000).*

The Park Service found that snowmobile use in Yellowstone and Grand Teton National Parks impaired park resources and values. This finding led the Park Service to act to remove the impairment caused by snowmobile use and put the parks on a path to restoration. In November 2000, the Park Service made the final decision to phase out snowmobiles from Yellowstone and Grand Teton National Parks.

*The use of snowmobiles and snowplanes at present levels harms the integrity of the resources and values of these three parks, and so constitutes an impairment of the resources, which is not permissible under the NPS Organic Act. In YNP, the impairment is the result of the impacts from snowmobile use on air quality, wildlife, the natural soundscape, and opportunities for enjoyment of the park by visitors. In GTNP, the impairment is the result of the impacts from snowmobile and snowplane use on the natural soundscape and opportunities for enjoyment of the park by visitors. (Record of Decision, November 2000)*

In Yellowstone and Grand Teton National Parks, the highest standard of protection— Organic Act prohibition on impairment—is violated by snowmobile use. That finding of impairment, combined with the finding that snowmobile use in Yellowstone and Grand Teton National Parks also conflicted with the directions given by Executive Orders 11644 and 11989, the Clean Air Act and NPS Management Policies, guided the Park Service to its final decision.

The Park Service found a solution to the problems caused by snowmobile use in the parks in an already existing mode of winter transportation: mass transit snowcoaches. The decision to phase out snowmobiles outlined a plan to increase the number of snowcoaches so that the same number of winter visitors could continue to enjoy Yellowstone, with far less impact. A snowcoach transit system “would reduce adverse impacts on park resources and values, better provide for public safety, and provide for public enjoyment of the parks in winter.”(Final Rule, January 2001). The Park Service outlined a plan to make the snowcoach system a reality through an implementation plan and a three-year phase in period in the Record of Decision and final rule.

Yellowstone and Grand Teton National Parks must comply with the Organic Act, the Yellowstone Act, NPS regulations, NPS Management Policies and Executive Orders 11644 and 11989. It is clear that any use of snowmobile use in the parks runs counter to existing laws and regulation. The purpose of the National Park System is clear: to protect park resources and ensure that visitor use does not cause impairment.

**2000 Decision and 2001 Rule Based on Comprehensive Public Process.** The press release from the Secretary of Interior's Office announcing the DSEIS refers to the decision to phase out snowmobiles as “rushed rulemaking”. In reality, the Park Service process which led to a November 2000 decision to phase out snowmobiles included more than ten years of scientific study, three years of NEPA analysis and public comment, and 22 public meetings and hearings. The public opportunity to engage in the winter use planning for YNP and GTNP was both extensive and comprehensive. In July 1999 – after ten years of study and research – the National Park Service released its draft EIS for public consideration and comment. During the EIS and rulemaking processes, there have been four separate opportunities for the public to comment, including 22 hearings in the region and across the nation. Locally, public hearings were held in towns such as West Yellowstone, Livingston, Cody, Jackson, and Idaho Falls. The public clearly welcomed the opportunity to comment on the Park Service's various proposals to protect America's oldest national park. The agency received over 70,000 individual comments.

At each stage of the input process, support for phasing out snowmobile use in the parks became more emphatic. Reacting to the DEIS, the greatest number of citizens who commented favored an end to in-park snowmobiling. This perspective grew to a two-to-one majority in the fall of 2000 when the public commented on the FEIS – and then to a four-to-one majority favoring a snowmobile phase out in early 2001 as the final rule went into the Federal Register. More recently, in October 2001, the public sent the same clear message: 82 percent commented in favor of the Park Service decision to phase out snowmobile use in the parks over a three-year period.

**2000 Decision and 2001 Rule based on best information concerning snowmobile technology.** The EIS forming the basis of the 2000 Decision and 2001 Final Rule was based on thorough analysis of the best available snowmobile technological information. There is no new information to cause a change the analysis or findings of the 2000 decision and 2001 rule.

The claimed existence of additional information concerning snowmobile air and noise emissions served as a chief reason for the new process. Before the SEIS process was initiated, the Park Service, in a February 5, 2001 letter to Arctic Cat CEO Christopher Twomey, asked for “results of last year's use and what improvements, if any, were made for this year's model. *Specifically: if you have any scientific reports on noise and emissions from this year's four-stroke snowmobiles that you can share with us, we would appreciate copies of them. If you do not have these scientific reports, please refer us to the appropriate contact.*” (emphasis added).

The Park Service received no answer to this information request. Instead, the International Snowmobile Manufacturers Association (ISMA) pressed on with litigation, stating that in fact new information did exist. According to the settlement agreement, ISMA had to provide any new information to the Park Service by July 30, 2001. ISMA did not adhere to this court-ordered deadline, and instead submitted an information packet nine days later, on August 8, 2001. ISMA stated that “the enclosed information is what is currently available and releasable”.

The information submitted did not include any scientific analysis or hard data. Instead, the submission was comprised of assertions of technological improvements that are not

backed up by information concerning how those assertions were obtained, under what conditions, or if they are replicable.

ISMA failed to provide any relevant data until later October 2001 (following repeated requests by NPS to fulfill their end of settlement agreement). The data that ISMA eventually did provide was found to be already analyzed within the parameters of the FEIS. Descriptions of the "new" information are found in the Draft DSEIS and the internal review draft. Each description dismisses the "new" information as not providing additional data or rationale for new analyses. The language of the internal review draft is more critical of this lack of new information than language in the Draft DSEIS.

Although the snowmobile industry reports that it is on the threshold of mass-producing much cleaner and much quieter machines—it says something entirely different to the EPA. In letters submitted to the EPA, the industry has argued for a weak emission standard. Specifically, the manufacturers have said it will not be until 2010 (at the earliest) that they can reduce carbon monoxide emissions by 50 percent. The manufacturers are also resisting labeling of their machines, which would leave the Park Service unable to distinguish between more-polluting and less-polluting snowmobiles.

EPA, a cooperating agency in the DSEIS process, has stressed to the Park Service and the other cooperating agencies that it is unclear when snowmobiles will be regulated by EPA, and if they are, by how much. Any EPA promulgated regulation will take 6-10 years to be fully implemented on the ground—this time lag is yet another factor that the Park Service analyzed in the EIS and found insufficient to address impairment issues and other impacts. Despite this information from EPA, the State of Wyoming's alternative 2 relies heavily on early implementation of the anticipated EPA emissions standards.

**Improved Snowmobile Technology Fails to Address Impacts to Air Quality and Natural Soundscapes.** In the "new" information submitted to NPS, Arctic Cat reported "that exhaust emissions have been cut by more than one half for CO and three quarters for HC". These types of emissions levels, and stricter, were analyzed by the Park Service in the Winter Use EIS and found insufficient to address issues of park impairment. Polaris reported that their "preliminary emissions data" show that the four-stroke machine will achieve "the 30% exhaust emission reduction of both HC and CO proposed by the industry to EPA for fleet average implementation in 2006." The Park Service went far beyond the 30% HC and CO emission level reductions advocated for by the snowmobile industry in its previous analysis and found that such reductions failed to address issues of impairment.

"Cleaner and quieter" snowmobiles were examined in several of the alternatives in the Draft and Final EIS. For example, the Final EIS provides analysis of improved snowmobile technologies in Alternative D. "In alternative D only 10% ethanol-blend fuels and bio-based lubricants would be sold in the parks. By winter 2008-2009, only snowmachines that have been certified to meet stricter emissions standards would be allowed in the parks. Oversnow vehicle emission rates would 40% of the baseline CO emission rate, 75% of the baseline PM<sub>10</sub> rate, and 70% of the baseline hydrocarbon emission rate." (FEIS p. 334).

These numbers were generated with the assistance of the Montana Department of Environmental Quality using best professional estimations of the then-current capacity for technological improvements. Today, with the emergence of four-stroke snowmobile technology, it is likely that professional judgment would yield still stricter emissions control estimates for what is technologically feasible. Despite the snowmobile industry's assertions regarding redesigned machines and improved emissions, industry numbers and projections submitted for the SEIS process remain well below what the Park Service already analyzed and determined insufficient for protection of park resources.

For example, in the area noise emissions and impact on natural quiet, the Park Service analyzed a 60dBA level at 50 feet as a "clean and quiet" level for all oversnow vehicles. The FEIS noted that the alternative for quieter snowmobiles yielded a substantial improvement over existing condition, but that the noise levels of the "cleaner and quieter" technology remained greater than alternative G, the preferred snowcoach alternative. (FEIS p.350). This alternative and all of the FEIS alternatives allowing continued snowmobile use were found to impair park resources. In the DSEIS snowmobile alternatives, noise emissions remain above 70dB (Alternative 2) or are undefined (Alternative 3), far above noise levels analyzed in the FEIS and found insufficient to comply with NPS law, regulation and policy.

#### **Improved Snowmobile Technology Fails to Address Impacts to Wildlife**

In relation to wildlife impacts, the Park Service concluded that "[e]ven with technical advances in snowmobiles, the impacts of snowmobile use on wildlife, especially ungulates using groomed routes, constitutes disturbance and harassment at a time when individual animals are particularly challenged for survival." (Record of Decision, 2000). The agency summarized:

*Cleaner, quieter snowmobiles would do little, if anything, to reduce the most serious impacts on wildlife, which are caused more by inappropriate use of snowmobiles than by the machines themselves. Quieter snowmobiles are still noisy, and are audible at greater distances than 4-track conversion snowcoaches. Since snowcoaches carry many passengers and snowmobiles only one or two, snowcoaches can accommodate the same level of overall winter visitation with far fewer noise impacts on the natural soundscape and other visitors than even quieter snowmobiles. (Record of Decision, 2000)*

**NPS Analyzed Alternatives Examining Improved Snowmobile Technologies for the 2000 Decision and 2001 Final Rule and Found Them Insufficient to Protect Park Resources.** In the EIS leading to the 2000 Decision and 2001 Rule, NPS thoroughly analyzed the impacts of new technology on wildlife, air quality, natural soundscapes and visitor experience in Yellowstone and Grand Teton national parks. The range of alternatives presented in the DEIS and FEIS analyzed continued snowmobile use and redesigned snowmobile design. Six of the seven alternatives examined continued snowmobile use in the parks. Continued snowmobile use was analyzed in several contexts: with minimal mitigation measures in the no action alternative A; to thorough analysis of potential improvements to snowmobile technology in alternatives B, D and F; to the use of guided tours and closure of routes in alternative F. The Park Service thoroughly analyzed redesigned snowmobile technology in the Draft and Final EIS based on scientific information and modeling.

The decision makers in 2000 and 2001 had the following tools—all of which were fully analyzed in the FEIS—to choose from: best available technologies, lower emissions standards, guided-only snowmobile tours; vehicle caps; adaptive management, education, enforcement, and carrying capacity. NPS laid out the most protective snowmobile alternative in FEIS Alternative F. Even this alternative was found insufficient to protect park resources. The Park Service concluded that “[t]he continued use of snowmobiles as provided in the alternatives studied...is found to be inconsistent with the health and integrity of resources existing in the three park units.” (NPS Record of Decision, November 2000).

**The DSEIS Reconfirms the NPS 2000 Decision to Phase Out Snowmobiles: Nothing New to Warrant Different Outcome**

The DSEIS contains nothing new regarding the major components of alternatives considered. The DSEIS makes clear that there is no new information or analyses that justify reversing the Yellowstone rule. NPS admits to this lack of difference between the FEIS and DSEIS: the “analysis and the alternatives in the DSEIS are not vastly different than those in the FEIS. What appears to have changed is the public’s perception regarding new technology, or its willingness to consider its use, and industry’s willingness and ability to produce it.” (DSEIS, p. 16) National park compliance with laws, regulations and policies is not meant to be governed by public perception or industry whim. The lack of new information in the DSEIS leaves NPS with only one choice: to uphold the 2000 Decision and 2001 Final Rule.

**Air Quality**

**Clean Air Act and Policy Requirements**

Requirements under the Clean Air Act and NPS policies contributed to the Park Service’s decision to phase-out snowmobiles from Yellowstone. Yellowstone and Grand Teton’s exceptional air quality—essential to fulfilling the Parks’ mission and mandates—is threatened by snowmobile use.

Through the Clean Air Act, Congress required special protections for lands where air is clear and pure, designated as Class I airsheds. Yellowstone and Grand Teton are both Class I airsheds. The Clean Air Act states that the National Park Service, as a federal land manager, has “an affirmative responsibility to protect air quality related values, including visibility, from the adverse effects of air pollution in areas that are designated as “Class I”.

There are 48 Class I areas that are part of the National Park System; their management is governed by the Prevention of Significant Deterioration program (PSD). Congress intended that these areas be afforded the greatest degree of air quality protection and specified that only very small amounts of air quality deterioration from new or modified major stationary sources be permitted.

One purpose of this Prevention of Significant Deterioration (PSD) program is “to preserve, protect, and *enhance* the air quality in national parks.” (42 U.S.C. §7401 *et seq.*) [emphasis added]. “These policies require managers to assume an aggressive role in promoting and pursuing measures to safeguard air quality and related values from the adverse impacts of air pollution” (Flores and Maniero, NPS 2000).

The NPS is mandated through both its own 1916 Organic Act (16 U.S.C. §1), the Clean Air Act (42 U.S.C. §7401 *et seq.*) and Executive Order 12088, as amended, to protect air quality in National Parks. “Accordingly, the Service will seek to perpetuate the best possible air quality in parks” because of its critical importance to “preserve natural resources and systems” and “sustain visitor enjoyment, human health, and scenic vistas”. (NPS Management Policies of 2001 at 4.7.1) “The Service will assume an aggressive role in promoting and pursuing measure to protect values from the adverse impact of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Service will err on the side of protecting air quality and related values for future generations.” (NPS Management Policies of 2001 at 4.7.1)

The Park Service’s 2001 decision to phase-out snowmobiles was required to comply with the Clean Air Act, Organic Act and NPS Management Policies. That decision ensured that air quality, and visibility, in Yellowstone and Grand Teton National Parks would meet and go beyond existing legal standards. A phase out of snowmobiles is the only way for the parks to meet the affirmative requirements of Class I airshed standards.

**Air Quality Impacts of Snowmobiles.** Although each year in Yellowstone, one million automobiles outnumber the 75,000 snowmobiles sixteen to one, snowmobiles contribute up to 68 percent of the carbon monoxide pollution and as much as 90 percent of the hydrocarbon pollution in the park.

Snowmobiles destroy air quality everywhere they are used. Even a small group of snowmobiles produce extremely high levels of pollution. According to California Air Resource Board emissions data, one hour on a two-stroke engine used by most snowmobiles and jet skis, produces more smog-forming pollution than a modern car creates in one year.<sup>1</sup> Every weekend in Yellowstone, snowmobiles at Old Faithful alone create more than a year’s worth of park-wide automobile pollution.

The failure to act immediately to halt snowmobile emissions violates the parks’ duty under the Clean Air Act and National Park Service Management Policy. Snowmobile emissions at levels damaging to public and employee health and degrading to the parks’ air quality have been occurring for years. Carbon monoxide levels in the park currently risk exceeding NAAQS and have exceeded MAAQS and NAAQS in the past. The highest carbon monoxide levels in the nation were recorded at Yellowstone’s West Entrance during winters in the 1990s. This directly violates NPS responsibility to ensure the quality of Class I areas. NPS must act immediately to ensure compliance with the Clean Air Act and act affirmatively to restore the Class I airsheds.

**Human Health Risks Associated with Snowmobile Exhaust.** Two-stroke engines power the vast majority of snowmobiles. These engines create dangerous levels of airborne toxins including nitrogen oxides, carbon monoxide, ozone, particulate matter, aldehydes, 1,3 butadiene, benzenes, and extremely persistent polycyclic aromatic hydrocarbons (PAH). EPA lists several of these compounds as “known” or “probable” human carcinogens. Benzene, for instance, is a “known” human carcinogen. And several

<sup>1</sup> Based on CARB data: (<http://www.arb.ca.gov>); January 5, 1999.

aldehydes including butadiene are classified as "probable human carcinogens." All are believed to cause deleterious health effects in humans and animals well short of fatal doses (EPA 1993).

Dangerous levels of carbon monoxide (CO) and particulate matter (PM) are also of great concern. CO is extremely dangerous to humans (discussed below), and particulate matter is a recently confirmed human carcinogen by the Environmental Protection Agency. Snowmobiles emit dangerously high levels of carbon monoxide. A study conducted for the National Park Service in 1997 concluded that a single snowmobile produces 500-1000 times more carbon monoxide than a 1988 passenger car (Fussell-Snook 1997). Notably, comparisons to a current model-year passenger vehicle would increase this figure significantly.

Two-stroke engines also discharge 25-30% of their fuel mixture, unburned, directly into the environment. Unburned fuel contains many toxic compounds including benzene, toluene, xylene and the extremely persistent suspected human carcinogen MTBE. Two-stroke engines are one of the largest unchecked sources of pollution nationwide. Extensive information is available on two-stroke engine emissions and the direct impacts to human health and air quality.

For six years, the Park Service has pumped fresh air into entrance booths to alleviate employee health problems caused by snowmobile exhaust. Visitors, too, must breathe the same polluted air, and many complain of the same symptoms as employees. Headaches, nausea, burning eyes, and more: the symptoms of carbon monoxide poisoning are found in park employees subjected to high levels of exhaust. This year, Park Service employees were outfitted with respirators to protect them from high levels of carbon monoxide, benzene and formaldehyde. An Occupational Safety and Health Administration inspection in February 2000 found higher than recommended levels of these pollutants. The Environmental Protection Agency noted that human health issues relating to air quality was a concern that needed to be addressed by the Park Service in its decision.

The blue haze found along snowmobile corridors, trailheads and gas stations contains not only dangerous levels of airborne toxins, but can lead to the formation of additional ground level ozone from the photochemical reaction of released nitrogen and hydrocarbons. Health risks associated with exposure to smog and nitrogen include respiratory complications such as coughing, chest pain, heart problems, asthma, concentration lapses and shortness of breath. Elderly individuals and children are particularly sensitive to ground level ozone and nitrogen.

In Yellowstone, concern about public health and excessive snowmobile pollution were issues raised in over 1,200 snowmobile complaint letters received by the park in 1993 and 1994. As a result, Yellowstone began to study snowmobile emissions and soon found that CO and PM concentrations were high enough to cause health and air quality concerns in West Yellowstone, along the snowmobile trail to Old Faithful, and in the parking lot at Old Faithful (NPS Air Quality Division 1995). In addition to adverse pollution impacts on visitors, Yellowstone has been forced to enclose ranger booths at its West Entrance to protect rangers from dizziness, nausea, fatigue, headaches, and breathing problems. Fresh air is pumped into entrance kiosks where rangers have

reported difficulty counting change. Park visitors have reported tasting the visible haze, which surrounds busy entrances and trailheads.

**NPS Responsibility to Protect Public and Employee Health and Safety.** As a federal employer, the NPS has the responsibility under OSHA and regulation to protect employee health. The Park Service also must perpetuate conditions in the best interest of public health. The permission of snowmobile use in the parks and concomitant impacts to air quality endanger park visitors with respiratory and other ailments and chemical sensitivities. The Park Service must provide a health environment for visitors; current snowmobile use precludes the parks' ability to ensure a clean, healthy environment for visitors and a healthy workplace for employees, as required by law.

There is no scientifically legitimate or legally defensible reason to wait any longer to improve public health and air quality within the Class I airsheds of Yellowstone and Grand Teton national parks.

**DSEIS Confirms that 2000 Decision and 2001 Rule Best Protect Visitor and Employee Health and Safety.** NPS concluded that Alternative G in the FEIS was the only alternative that would not impair air quality and visitor and employee health. The DSEIS reaffirms this finding. Under Alternatives 1a and 1b: "Exposure to pollutants and sounds at the West Entrance would be significantly reduced. Additionally, fewer numbers of oversnow vehicles on the roads would help to maintain a smoother road surface and reduce the number of needed ranger patrols. This would minimize injuries to employees caused the jarring of a bumpy road surface. Employees would also not be exposed to unsafe operation of snowmobiles." (DSEIS 168)

The DSEIS is clear that upholding the 2000 Decision "would achieve the greatest improvement relative to the existing condition...With the fewest numbers and types of vehicles operating at speeds and schedules that minimize risk of incident", a snowcoach system is safer than continued snowmobile use. Upholding the snowcoach decision would also "produce the lowest emissions levels." (DSEIS at xi). With rangers wearing respirators, and visitors breathing the same unhealthy air, the DSEIS outlines a clear choice for NPS. In order to comply with law and policy, NPS must select Alternative 1a and immediately correct long-standing risks to public health and safety.

Other alternatives fail to meet NPS legal duty to protect visitor and employee health. Alternatives 2 and 3 would increase health risks to the public and employees due to the presence of snowmobile exhaust. "Because snowmobile would be allowed in the parks [under Alternative 2], effects would increase relative to alternative 1a." (DSEIS 169) And similarly, "[b]ecause snowmobiles would be allowed in the parks under alternative 3, effects would increase relative to alternative 1a." (DSEIS 170)

**Impacts to Wildlife.** According to NPS regulations, snowmobiles are prohibited except where designated and "only when their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and *will not disturb wildlife* or damage park resources" (36 CFR 2.18(c)) (emphasis added).

The prohibition against disturbance of wildlife is a "no tolerance" restriction. Any disturbance of wildlife violates the regulation and must be removed by NPS. Disturbance

is defined in the DSEIS as "to interfere with, or destroy the tranquility or composure of wildlife." (DSEIS, p.116)

NPS Management Policies further state that "The National Park Service will maintain as parts of the natural ecosystems of parks all native plants and animals...The Service will achieve this maintenance by...[m]inimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them." (NPS Policies at 4.4.1)

#### **Snowmobile Impacts to Wildlife**

Winter in Yellowstone and Grand Teton is a critical time for wildlife when any added stress can mean the difference between survival and death. The literature describes "several important factors: the extreme challenges wildlife species face in severe winter environments; the high importance of winter ranges as refuges; and describes the effects that human activities cause when superimposed on these ranges (see FEIS, pages 237-241)." (DSEIS, p. 117). Furthermore, "Ungulates function at an energy deficit during winter because snow reduces forage availability, affects an animal's ability to escape predators, and increases energy costs at a period of time when the nutritional value of winter forage is low." (DSEIS p. 123).

Numerous studies since the 1970s have reported that "thermal areas with snow-free vegetation or shallow snow are also very important winter habitats for elk along the Madison, Firehole, and Gibbon Rivers." Yellowstone's main oversnow access roads are built in these river valleys, setting up conflict between winter visitors and wildlife. This conflict, primarily between snowmobiles and wildlife, is unacceptable in a national park.

#### *Impacts to Wildlife: FEIS and DSEIS Findings*

Eighteen Ph.D. scientists, including many of North America's foremost experts in wildlife biology and ecology, recently concluded that the Park Service relied upon sound science in its decision to phase out snowmobile use from Yellowstone and Grand Teton national parks. In October, 2001, the scientists sent a letter to Interior Gale Secretary Norton cautioning her that: "ignoring this information would not be consistent with the original vision intended to keep our national parks unimpaired for future generations."

*Based on the scientific evidence, it is our professional opinion that snowmobiling results in significant direct, indirect, and cumulative impacts on wildlife, their behavior and environment. As documented in the scientific literature and the Park Service's EIS and ROD, impacts to wildlife include harassment, displacement from important or critical habitats, disruption of feeding activities, alteration in habitat use and distribution patterns, and depletion of critical energy supplies in individual animals potentially resulting in increased mortality or reduced productivity. Such impacts are magnified in the severe winter climate of the Greater Yellowstone Ecosystem where energy is a critical factor in determining survival.*

*Given the nature preservation mandate of the NPS, the harassment, degradation, and disruption of park wildlife attributable to snowmobiling clearly violate the NPS impairment standard. Ignoring this information would not be consistent with*

*the original vision intended to keep our national parks unimpaired for future generations. (Letter to Secretary Gale Norton, October, 2001)*

**2000 Decision and 2001 Final Rule Findings of Impairment to Wildlife.** NPS found continued snowmobile use to impair wildlife in the parks and violate guiding laws, regulations and policy.

Alternative F in the Final EIS analyzed the use of guided snowmobile tours, as in Alternative 3 of the Draft Supplemental EIS, and Alternative F was found to cause impairment. "The continued use of snowmobiles as provided in the alternatives studied...is found to be inconsistent with the health and integrity of resources existing in the three park units." (ROD)

**DSEIS Reconfirms Findings of 2000 Decision and 2001 Final Rule.** The DEIS "maintains, as concluded in the FEIS and ROD, that there are indeed effects to wildlife from oversnow motorized use, and that these effects are adverse. The parks were established, in part, to provide areas of security for wildlife. Population level effects do not need to be indisputably proven in order for the parks to make a determination that adverse effects to animals are occurring as a consequence of oversnow motorized use in critical ungulate winter range..." (DSEIS p.119). NPS park policies, regulations and Executive Orders clearly state that disturbance to wildlife, regardless of population-level effects, is unacceptable in the national parks." (p.216)

"Rangers were asked to provide narrative accounts on their experiences dealing with oversnow motorized use and wildlife in YNP. Of the nine rangers who provided written accounts, all emphasized the frequent, often daily, occurrence of conflicts among ungulates (primarily bison) and oversnow motorized use, particularly snowmobiles." (DSEIS p. 117) Table 76 on page 211 of the DSEIS shows "relative risks associated with each road segment as based on a YNP employee survey related to wildlife and oversnow motorized use conflicts." The potential for conflict was rated high, medium or low; high indicates "daily occurrences of conflicts between wildlife and oversnow motorized traffic, medium "indicates weekly conflicts", and low "indicates monthly conflicts." Alternatives 1a and 1b will yield low risk for wildlife/traffic conflicts for all road segments. Alternative 2 would create more conflict as compared to the current situation, yielding a high or medium risk on every road segment. Alternative 3 would spread conflict to currently low-use road segments, yielding an end result of similar net conflict to the current situation. (See attached table).

The risk to wildlife is increased based on the sheer number of vehicles operating on road segments. "Therefore, it may be concluded that the greater the number of oversnow vehicles in wildlife winter range, the higher the risk of harassment and displacement." (p.209) Since DSEIS Alternative 1a removes all snowmobile use and would require a snowcoach fleet of 150 vehicles, overall motorized use of park roadways is significantly reduced. Since snowcoaches hold 10-15 people and snowmobile 1-2, Alternative 1a would reduce the total number of oversnow vehicles at risk of disturbing park wildlife by up to 90%.

*DSEIS Alternative 1a provides best compliance with NPS regulations and policy*

"Alternative 1a prohibits the use of snowmobiles. Therefore the overall number of oversnow vehicles in YNP would be greatly reduced. ...for road segments that currently have a high risk for wildlife-oversnow motorized use conflicts, risks greatly decrease due to the elimination of snowmobiles specifically, and the overall reduction in traffic volumes generally." (p.210). "Compared to current levels of snowmobile use, traffic levels would be reduced by a factor of eight or more..." (DSEIS p.213). Further improving matters for wildlife and compliance with regulation, "NPS policy would require that snowcoach drivers be trained to recognize potential wildlife conflicts and instructed to stop only in areas where wildlife would be unaffected." (DSEIS p.213)

"Conclusions described in the FEIS on page 422 remain valid. The potential for adverse impacts to elk and bison from oversnow motorized use under alternative 1a range from none to minor, and all would be considered short term. Specifically, there would be an expected reduction or elimination of road killed large mammals due to the elimination of snowmobiles in the parks. In addition, the replacement of individual snowmobiles with mass transit snowcoaches would serve to decrease potential risks associated with disturbance along particular road segments by greatly reducing traffic volume." (p.214)

Under Alternative 2 "overall associated effects would increase relative to alternative 1a," simply by virtue of leaving snowmobiles in the park, regardless of technology and number. (DSEIS p.215). "Specifically, road kill mortality caused by oversnow vehicles would be greater (the occurrence is historically limited to snowmobiles only), risks associated with harassment and displacement would increase, and physiological stress responses would rise due to higher traffic volumes." (DSEIS p.216-7)

With Alternative 3, "[o]verall, effects increase relative to alternative 1a because snowmobile are allowed in the parks on all major existing motorized routes except the Teton Park Road and Jackson Lake." (p.219) Under alternative 3, reductions in risk along some road segments "may be made up for on other segments where the number of expected vehicles would rise due to redistributed use throughout the park." (p.218)

**Impacts to Natural Soundscapes.** The opportunity to experience natural sounds and silence is rare in our modernized world; one of the last refuges to experience natural sounds is in our national parks. Current use of snowmobiles in the parks undermines the opportunity to have natural quiet as a part of the national park experience. Snowmobiles emit extreme levels of noise at higher frequencies than automobiles. This combination makes snowmobile noise quantitatively and qualitatively different from other vehicle use in the parks. The Park Service must do everything it can to reduce noise levels in parks to prevent the intrusion of urban noises into park lands.

"The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. Natural soundscapes exist in the absence of human-cause sound." Natural soundscapes are comprised of animal sounds and sounds of the physical environment. In Yellowstone, the hiss and splash of a geyser, the bubbling of a mudpot and the grunt of a bison are an irreplaceable part of the park experience. Sadly, today the roar and whine of snowmobiles too often drown out the natural sounds of Yellowstone and Grand Teton.

Snowmobile use in Yellowstone National Park undermines visitors' opportunities to hear natural sounds and quiet as part of their park experience. Snowmobiles emit significant amounts of noise at higher frequencies than automobiles. This combination of volume and pitch makes snowmobile noise quantitatively and qualitatively different from other vehicle use in Yellowstone National Park.

NPS Management Policies of 2001 direct that "The Service will restore degraded soundscapes to the natural condition wherever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound). "The Service will take action to prevent or minimize all noise that, through frequency, magnitude or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor use at the sites being monitored." (NPS Management Policies at 4.9)

*DSEIS Alternative 1a provides best compliance with NPS regulations and policy*  
The DSEIS demonstrates that a transition to snowcoach access will dramatically reduce the number of places in Yellowstone and Grand Teton where visitors will hear engine noise more than 50 percent of the time. It shows that if snowmobile use is not phased out, the amount of park land dominated by the roar and whine of machines will be ten to 20 times greater than visitors would experience with snowcoach access. (DSEIS at 220) "For alternatives 1a and 1b, of particular note is the limited acreage in the parks where snowmachines would be heard 50% of the time or more." (p.233-see Table 84-86).

"Alternatives 1a and 1b have the least impact on areas in which no noise is expected, thereby affecting the natural soundscape the least by a substantial margin." (p.251)

**Impacts to Visitor Experiences.** NPS Management Policies clarifies the affirmative duty of the Park Service to protect resources and ensure the highest quality experience for park visitors. (NPS Management Policies at 8.2) The policies state that the Park Service will provide appropriate, high quality opportunities for visitors to enjoy parks. The policies also make clear that many forms of recreation enjoyed by the public do not require a national park setting and, in fact, can be accomplished more appropriately elsewhere.

As a result, the policies require the Park Service:

*To provide for enjoyment of the parks, the National Park Service will encourage visitor activities that:*

- *Are appropriate to the purposes for which the park was established;*
- *Are inspirational, educational, or healthful and otherwise appropriate to the park environment;*
- *Will foster an understanding of, and appreciation for, park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and*
- *Can be sustained without causing unacceptable impacts to park resources or values.* (NPS Management Policies at 8.2).

Additionally, the Park Service is directed to "[p]rovide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks." If some types of recreation are not suited for a national park setting, parks can "[d]efer to

local, state, and other federal agencies; private industry; and non-governmental organizations to meet the broader spectrum of recreational needs and demands." (NPS Management Policies at 8.2).

For the visitor able to come to Yellowstone in winter only once in a lifetime, the ability to breathe pure air, hear natural sounds and view wildlife in its natural state is of the utmost importance. "Winter visitor surveys indicate that the most important factors for visitor enjoyment in the parks are opportunities to view scenery and wildlife, the safe behavior of others, and opportunities to experience clean air and solitude." (Final Rule) The Park Service found that snowmobiles adversely impact all of these components of visitor experience, detracting from the intent of Park Service mission and policies.

"Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks. However, many forms of recreation enjoyed by the public do not require a national park setting and are more appropriate to other venues. The Service will therefore:

- ◆ Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks.

"Unless mandated by statute, the Service will not allow visitors to conduct activities that:

- ◆ Would impair park resources or values;
- ◆ Create an unsafe or unhealthful environment for other visitors or employees;
- ◆ Are contrary to the purposes for which the park was established, or
- ◆ Unreasonably interfere with: the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic or commemorative locations within the park;..."

(NPS Management Policies of 2001, at 8.2)

Results of surveys show that the two primary reasons for winter visitation are to view scenery and view wildlife. The top four reasons given for snowmobiling in Montana were to "observe scenic beauty, take in natural surroundings, enjoy smells and sounds of nature, and understand the natural world better." (DSEIS p.137) Furthermore, "A recent study indicates that respondents ranked experiencing tranquility, peace, quiet, and getting away from crowds as highly important." (p. 257) Alternative 1a/b state: "The reduction in emissions and sound under this alternative would result in direct major beneficial improvement to the experiences of park visitors." (p.258)

**Socioeconomics: Phase Out of Snowmobiles Favored by Significant Portion of Local Economies. Protection of Park Encouraged as Best Business Plan.** Contrary to what the snowmobile industry has claimed, the residents of West Yellowstone, Montana, the most invested snowmobile economy in the region, are not uniformly in favor of continued snowmobiling in the parks. Over 150 business owners, elected officials, and residents—nearly a third of the town's voting population—signed a petition asking the Park Service and Congress to protect Yellowstone National Park.

Over the past eighteen months two town councilmen have asked Congress for the opportunity to convey that many of their constituents believe vigorous protection of Yellowstone is essential to their town's future economic health.

The economic relationship is not as strong as the snowmobile industry claims. Visitor spending in West Yellowstone during the winter season have increased each year since 1993 while the numbers of visitors to Yellowstone National Park through the west entrance have declined slightly during the same period. According to the Final EIS, the average West Yellowstone visitor eager to snowmobile spends just one day in the park and far more time on the hundreds of miles of snowmobile trails outside Yellowstone. (FEIS p. 402)

Over 150 West Yellowstone business people, elected officials and residents—nearly a third of the town's voting population signed the petition "A Call for a Healthy Economy and a Healthy Park" asking the Park Service and Congress to:

- Protect Yellowstone and thereby ensure that visitors continue to visit West Yellowstone and support the local economy'
- Support the community of West Yellowstone as it adjusts, diversifies and rises to meet the challenges created by changes in park management.

Contrary to a small vocal industry-supported minority, the West Yellowstone economy will survive and flourish without snowmobiles inside the boundaries of Yellowstone and Grand Teton national Parks. Protection of Yellowstone National Park, the chief economic asset of local communities, will do the most to ensure continued economic success for West Yellowstone and other gateway towns.

**Summary of Contents.** In conclusion, the Park Service determined, through the original three-year process, that national parks cannot wait for improved technology and that improved technology doesn't address the range of issues NPS must address in managing national parks. In Yellowstone and Grand Teton National Parks, this range of issues extends far beyond air quality and soundscapes to wildlife, visitor enjoyment, employee and visitor health and safety, road conditions and park values.

The DSEIS, causing a 16 month delay in protecting Yellowstone and costing taxpayers \$2.4 million, arrives at the same determination: a phase out of snowmobiles is needed to protect park resources and values and provide a high quality visitor experience. A failure by the administration to follow through on the DSEIS determination and uphold the rule to protect Yellowstone from snowmobile damage would be based solely on a desire to satisfy the snowmobile industry. Such a decision to allow continued degradation of Yellowstone and Grand Teton national parks would be at odds with national park law, regulation and policy, a large body of science, and an extensive public process.

In the meantime, an eminently feasible snowcoach plan sits on the books with an implementation plan thoughtfully laid out by the Park Service two years ago. The Park Service and the Department of the Interior have the opportunity to move forward with plans to create a successful winter snowcoach transit system in Yellowstone by working with local communities to transition economies and purchase additional vehicles.

Sadly, little energy or resources have been expended to implement the existing decision, which is still legally in force. That decision will hold if continued snowmobile use is found again to adversely impact resources. The delay in moving forward with implementation measure will be translated into a further delay for protection of Yellowstone and Grand Teton National Parks, if the phase out is put off for even longer.



Please make the necessary actions to implement the NPS rule to phase out snowmobiles in the parks as soon as possible.

Thank you for the opportunity to provide comments on such an important issue. We look forward to hearing from you about the future of Yellowstone and Grand Teton National Parks.

Respectfully,

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MST

To: grte\_winter\_use\_seis@nps.gov  
cc:  
Subject: SEIS Comments

To whom it may concern:

Attached are Bluewater Network's comments on the National Park Service's supplemental environmental impact statement regarding winter use at Yellowstone and Grand Teton National Parks.

These comments and their support materials have also been sent via FedEx.

Sincerely,

Sean Smith  
Bluewater Network



SEIS Comments do \* \* \* \* \*

NOTE: Bluewater Network has become an independent 501(c)(3) organization. Please note our new emails and addresses below.

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Bluewater Network is a national organization aggressively confronting the root causes of climate change and fighting environmental damage from the shipping, oil, and motorized recreation industries. Your support is critical to the success of our activities, and there are many ways you can assist us: send a donation, donate your used car, become an eActivist, or volunteer! For more information, visit our website, [www.bluewaternetwork.org](http://www.bluewaternetwork.org).

URGENT: If you haven't already done so, I encourage you to send an email to [bluewater@earthlink.org](mailto:bluewater@earthlink.org) asking to be placed on our electronic newsletter and action alert listserve. Through this listserve, we update concerned citizens on governmental and industry actions impacting the environment and how you can get involved. Moreover, please encourage all your friends and colleagues to join the listserve as well.

\* \* \* \* \*

Of all the questions which can come before this nation, none of the actual preservation of its existence in a great war, there is none which compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us, and training them into a better race to inhabit the land.

and pass it on. -Teddy Roosevelt, 1910

We have to remain constantly vigilant to prevent raids by those who would selfishly exploit our common heritage for their private gain. Such raids on our natural resources are not examples of enterprise and initiative. They are attempts to take from all the people for the benefit of a few. President Harry S. Truman, December 1948, at the inauguration of Everglades National Park.



May 29, 2002

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, WY 83012

**RE: Comments on Supplemental Environmental Impact Statement (SEIS) for Yellowstone and Grand Teton National Parks**

To Whom It May Concern:

On behalf of Bluewater Network and the millions of concerned citizens we represent, I respectfully submit the following comments on the National Park Service's (NPS) supplemental impact statement regarding snowmobile use in Yellowstone and Grand Teton National Parks.

**Full Support for Alternative 1A**

Bluewater Network fully supports the original winter use plan that banned recreational snowmobiling from Yellowstone and Grand Teton National Parks. Moreover, we believe the draft Supplemental Environmental Impact Statement (SEIS) contains insufficient information for the NPS to legally overturn the original decision. Still, the SEIS supports the position that alternative 1A, which represents the original snowmobile ban, is the one that best protects the parks air and water quality, visitor enjoyment, public health and safety, natural soundscapes, and wildlife. Therefore, we strongly urge the NPS to adopt alternative 1A of the SEIS.

Enclosed please find Bluewater Network's scoping comments on the SEIS. These comments provide great detail on why snowmobiles should be prohibited from these two parks and replaced with a mass-transit snowcoach system. Please include them in the SEIS' administrative record.

**Snowmobiles Damage Park Resources and Wildlife**

The following is provided to give an overview of the impact snowmobiles have on the environment and wildlife. For more on these impacts, please see enclosed petition urging that the Park Service eliminate snowmobile use in our parks.

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### ***Snowmobiles Degrade Air Quality***

Two-stroke motors power nearly all snowmobiles on the market today. Recent research by the California Air Resource Board (CARB) confirms that two-stroke engines are highly polluting and spew roughly 25 to 30 percent of their gas and oil mixture unburned out the tailpipe. Studies by the University of Denver found that Yellowstone's snowmobiles are responsible for roughly 27 percent of the park's carbon monoxide (CO) pollution and 77 percent of its hydrocarbon pollution (HC), despite the fact that the machines represent less than seven percent of the park's vehicle traffic.

CARB's examination also found that so-called "cleaner and quieter" thrillcraft engines do not solve all air and water quality problems. In fact, this technology can emit pollutants such as nitrogen oxides (NOx), carbon monoxide (CO), and formaldehyde at greater levels than comparable two-stroke engines. Moreover, "cleaner and quieter" snowmobiles are unlikely to reduce the machines' impact upon wildlife, public safety, and traffic congestion.

Finally, permeation emissions from snowmobile fuel systems are also a major concern. Permeation is the process by which individual fuel molecules may penetrate the walls of various assembly components of a fuel system directly to the outside ambient air. These emissions can have a detrimental impact upon air quality. For example, in California the Air Resources Board (CARB) estimates that reactive organic gases (ROG) emission from the 9.8 million untreated portable fuel containers (gas cans with nominal capacity of ten gallons or less) is 87 tons per day. This is equivalent to the emissions from about 1 million cars. If these tanks had been left untreated, CARB projected that ROG emissions would have risen to 96 tons per day by 2010.

According to CARB, evaporative and permeation emissions from nonroad engines/fuel systems and gas tanks are significant. For example, CARB research found that a typical nonroad engine (5-gallon fuel tank filled to half its capacity) is likely to emit over seven grams of hydrocarbon pollution in a 24-hour summer diurnal cycle.

High-density polyethylene (HDPE) fuel tanks are particularly susceptible to permeation losses. CARB testing found that a Honda HDPE tank emits roughly 4.57 g/gal/day. According to the Environmental Protection Agency, many of America's approximately 1.4 million snowmobiles have similar tanks. As a result, permeation losses from snowmobiles could have a significant impact upon Yellowstone and Grand Teton's air quality. Unfortunately, the SEIS appears to completely ignore permeation pollution. This is oversight calls into question the thoroughness of the pollution analysis presented in the draft SEIS.

### ***Snowmobiles Harass Wildlife***

Wildlife biologists across North America have documented the damage snowmobiles inflict on wildlife. Studies near Grand Teton found that snowmobiles, even restricted to

groomed trails, push moose out of preferred habitats, thereby reducing their ability to find food and conserve energy.

Snowmobiles also impact wildlife from great distances and can change the dynamics of entire populations. Scientists in Canada have found that snowmobiles can spook large ungulates such as caribou from more than a quarter mile away. At Yellowstone, a 20-year study uncovered that groomed snowmobile trails are permitting the Westward migration of bison into Montana. Unfortunately, state officials are shooting these animals as they leave the park for fear that they carry disease. The removal of bison negatively impacts the survival of other species, such as wolves and grizzly bears.

### ***Snowmobiles Noise Destroys Natural Soundscapes***

Snowmobiles blare noise at levels similar to that of a busy city street. The noise carries great distances, shattering the tranquility of the park and disrupting the enjoyment of other park visitors. At Grand Teton, the Park Service found that snowmobiles on groomed roads can easily be heard a mile away. In Yellowstone, another study found that at sites such as Old Faithful, snowmobile noise could be heard more than 90 percent of the time.

### ***Snowmobiles Threaten Public Safety***

Snowmobiling is a dangerous sport. According to the Consumer Product Safety Commission, roughly 10,000 people are treated every year in emergency rooms for snowmobile-related injuries. Furthermore, a recent study by Michael G. Landen, M.D. found that people who snowmobile frequently are almost nine times more likely to suffer death or injury in accidents than automobile drivers on a per mile comparison. During one holiday weekend this past winter, nine snowmobile riders were killed in Michigan alone.

### ***Cleaner and Quieter Snowmobiles Won't Solve All Problems***

The snowmobile industry is pushing so-called "cleaner and quieter" machines as the answer to all problems associated with the craft. Unfortunately, scientists and researchers are finding that snowmobiles, even with this prototype technology, still cause significant damage to the environment and wildlife.

Enclosed please find the CARB report Outboard Engine and Personal Watercraft Emissions to Air and Water: A Laboratory Study. The purpose of this study was to evaluate compare emission levels across technologies, with particular emphasis on two-stroke vs. four-stroke engines and conventional vs. advanced fuel-management systems.

The following are a summary of CARB's results:

- **Air Pollution**

For all measured air pollutants, two-stroke engines were generally and substantially higher than comparable four-stroke engines. In the case of hydrocarbons (THC), two-stroke motors were far more polluting than comparable four-stroke motors.

- **Water Pollution**

Similar to air emissions, pollutant concentrations in the water column of two-stroke and DI engines were consistently higher than those of comparable four-stroke engines. This was true for many pollutants including MTBE, BTEX, benzene and acetaldehyde. Moreover, both the carbureted and DI two-strokes were found to emit polycyclic aromatic hydrocarbons (PAH). This is particularly troubling because PAH - even at minute levels of parts per trillion - are toxic to aquatic plants and fish. The research also found that concentrations of many of these pollutants remained substantially elevated in the test tank one full day after testing.

- **Direct-Injected Two-strokes and Four-stroke PWC Did Not Solve All Problems**

CARB research also found that although direct-injected (DI) two-stroke engines were cleaner than carbureted two-strokes, on average they were dirtier than four-stroke engines. For example, DI engines emit approximately seven times more total hydrocarbons (THC) than do four-stroke engines. THC is a key component in the formation of smog. In the case of formaldehyde, a possible human carcinogen, DI engines emitted more than both the carbureted two-strokes and four-stroke engines. While four-strokes were substantially better in terms of discharging less of some of the most important pollutants, they did not solve all problems. In the case of nitrogen oxides (NOx) and carbon monoxide (CO), the four-stroke engine emitted more than the DI engines.

Moreover, this new technology will do nothing to reduce the impact of the more than 1.4 million snowmobiles currently racing across public lands. Finally, the so-called "cleaner and quieter" machines are unlikely to improve the craft's horrific safety record or its impact upon wildlife.

**Snowcoaches Reduce These Impacts**

The data above plainly show that a snowmobile prohibition in the parks will greatly improve air quality, reduce wildlife harassment, restore natural sounds, and better protect public health and safety. By comparison, the draft SEIS clearly shows that conversion to a mass transit snowcoach system will significantly reduce these impacts. According to the Environmental Protection Agency (EPA), the planned transition to snowcoaches "would provide the best available protection to human health, wildlife, visibility, while maintaining motorized and non-motorized winter access to these parks."

**New Industry Data Does Not Support Overturning the Phase-out**

In December of 2000, the International Snowmobile Manufacturers Association (ISMA) challenged in court the NPS' plan in the Winter Use Environmental Impact Statement (FEIS) to phase out snowmobiles. The ISMA contended that the FEIS should be overturned because the Park Service relied on faulty data. In particular, the ISMA believed that NPS numbers regarding snowmobile pollution failed to incorporate data on so-called "cleaner and quieter" machines. The industry maintains that the use of "cleaner and quieter" machines can produce reductions in air emissions that approach those of the snowcoach alternative. Early in 2001, the ISMA and the Department of Justice settled the lawsuit. One of the terms of the settlement required the government to conduct another review of snowmobile use in the parks so that the Park Service could consider new information on snowmobile emissions.

Throughout the summer and fall of 2001, the snowmobile industry submitted several documents to the NPS, claiming those documents would support the position that the ban should be overturned. Unfortunately, much of this information was neither new nor even scientifically relevant. In fact, in a draft version of the SEIS, the National Park Service reached this same conclusion. (See page 64 of DSEIS.) For example:

**Materials submitted as New Information**

1. Letter of Aug 7

**NPS Response**

*"It does not provide sufficient information for modeling purposes."*

2. Letter of Sept. 28

*"It does not provide sufficient information for modeling purposes."*

3 Letter of Oct. 9

*"Information on emissions is within FEIS parameters. No noise or particulate data is provided."*

4 Letter of Nov. 8

*"Emissions information is used in SEIS model, but is within FEIS parameters. No noise or particulate data is provided."*

Next, industry claims that based upon its "new" emissions data, park pollution can be reduced by 75 percent. However, industry's own documents do not support this claim. On page 22 of Appendix C, the industry states that "new technologies including four-strokes models will substantially and dramatically curtail emissions. Such a management regime

is likely to rapidly reduce HC emissions associated with snowmobiles by approximately 67 percent and CO emissions by 58 percent.” These figures are a long way from both its own 75 percent reduction claim, as well as the snowcoach alternative’s 85 percent goal.

Moreover, according to the draft SEIS, Alternative 2 is unlikely to result in a 75 percent reduction. In particular, Alternative 2 states that snowmobiles entering the park will be allowed to emit roughly 200 g/kW-hr of CO and 75 g/kW-hr of HC (see SEIS page 45). This means that snowmobiles entering Yellowstone and Grand Teton under Alternative 2 can emit more than three times as much CO and 11 times more HC as compared to the best snowmobiles. From this data, it appears that actual machines entering the park, which will include “four-strokes and any other models,” are unlikely to reduce snowmobile emissions by 75 percent.

The credibility of industry’s 75 percent claim is further eroded by ISMA’s own comments to the EPA on the agency’s snowmobile emission regulations. In those comments, ISMA states that it “proposes to reduce emissions of HC and CO by 30 percent over the next six years. We believe that this proposal represents the most stringent emissions reductions possible, given current technological limitations and the prohibitive costs that would result from more stringent reductions.” (See ISMA comments page 4). So in the end, it appears that industry’s hope for emissions reduction will likely fall far short of the 75 percent claim.

Since most of the data industry submitted for inclusion in the SEIS does not support their position, it clearly does not provide the Park Service with the either legal justification or scientific evidence necessary to overturn the original decision of the FEIS.

### **SwRI Study**

According to a recent study by the SouthWest Research Institute (SwRI), new four-stroke snowmobiles are supposedly cleaner and quieter than conventional snowcoaches.

SwRI found that three 2002 four-stroke Arctic Cat snowmobiles making two passes at full acceleration in both directions registered an average decibel level of 70.5. The quieter of two snowcoaches, a Bombardier with a 318 Chrysler gas engine, averaged 73 decibels at a top-end speed of 30 mph based on two passes in each direction, according to the study. Moreover, SwRI discovered that the final and supplemental impact statements understate the emissions from snowcoaches by nearly 50 percent. Snowcoaches average six riders per vehicle while snowmobiles average 1.2 riders per sled, the study said. Five new generation snowmobiles would provide the same visitor transportation as one coach, but would have total carbon monoxide emissions of 86.45 grams per mile compared with the snowcoach’s emissions of 99.2 grams per mile.

However, there are major flaws in SwRI methods and reasoning. First, the EPA under the Bush Administration totally rejects SwRI testing methods in its comments on the SEIS. In particular, the EPA faults SwRI for not quantifying the amount of time a typical

snowcoach would operate in an open or closed loop. Open-loop operation produces significantly higher emissions; however, snowcoaches are likely to operate in a closed loop, except during extreme conditions. The EPA goes on to state that SwRI failure to quantify the amount of time a snowcoach would operate in the two loops means their report “is of little use in the SEIS analysis of snowcoach emissions.”

Moreover, it appears that SwRI research compared the cleanest snowmobiles against the dirtiest snowcoaches. A better method would be to contrast the cleanest snowmobiles against the cleanest snowcoaches. If SwRI had done this, they would have found that snowcoaches are far cleaner than even the four-stroke snowmobiles. EPA emissions data for 15 passenger vans (which can easily be converted into snowcoaches – see [www.mattracks.com](http://www.mattracks.com)) are far cleaner than even the best four-stroke snowmobiles. For example, according to industry’s own data (see Appendix C page 32 of the SEIS), four-stroke snowmobiles emit 21 times more HC, 18 times more CO, and 4 times more NOx than a 15 passenger Ford van. (See EPA emissions data on Ford 6.8L engine.) If all snowcoaches were converted to gasoline-powered vans, it is likely that the snowcoach alternative would further reduce winter pollution emissions, perhaps even surpassing the 85% reduction goal as contained in Alternative 1A.

SwRI also overlooks the fact that allowing snowmobiles under either Alternative 2 or 3 would still have a greater impact upon natural soundscapes, traffic congestion, and park wildlife than the snowcoach plan. Using industry’s numbers of 1.2 passengers per snowmobile and 6 passengers per snowcoach, it would take roughly 830 snowmobiles to move 1,000 visitors through the park. By comparison, the snowcoach option would only require about 160 machines.

The 160 estimate is probably the upper limit of the number of snowcoaches needed to move 1,000 people through the park. However, if snowcoach ridership approaches capacity which is what will happen under Alternative 1A - the number of vehicles needed to move these visitors would be cut in half. Obviously with fewer machines operating in the park, the snowcoach alternative will produce less overall noise. Moreover, a reduction in machines means less traffic congestion and fewer motorized conflicts with park wildlife.

### **Economic Impacts**

Many industry representatives contend that a snowmobile prohibition at Yellowstone and Grand Teton National Parks will have dire consequences for the parks’ surrounding communities. However, the exact opposite may be true. Throughout March of 2001, the Park Service prohibited snowmobile operation due to a lack of snow. However, snowcoach use continued. West Yellowstone’s records show that during the month long snowmobile ban, resort tax receipts were up more than 66 percent as compared to the previous March. These records indicate that local communities that remain solely dependent on snowmobile operations may be hurting their long-term economic survival.

Furthermore, even snowmobile proponents admit that snowmobilers who visit the Greater Yellowstone Area (GYA) spend very few days in the park. According to the BlueRibbon Coalition, on average snowmobilers spend roughly seven to 14 days in the GYA. During this time, it is estimated that they spend less than two days in the park. This is due in part to the thousands of miles of snowmobile trails around Grand Teton and Yellowstone. This means that snowmobilers, despite the ban on their machines, are still likely to visit the area. (For more on the economic impacts of phasing out snowmobiles and replacing them with a mass-transit snowcoach system, please see enclosed letter concerning the Small Business Administration's supplemental comments on the National Park Service's final rule phasing out snowmobiles. In particular, please note section E of this letter. Also, please see enclosed *USA Today* editorial, and snowmobile trails table.)

### **Broad Public Support for Phase-out**

This SEIS comment period marks the fifth time the NPS has solicited public input on snowmobile operation. During every one of the previous comment periods, the public has overwhelmingly stated that it wants snowmobiles removed from these parks. For example, of the public comments on the final rule regarding snowmobile use at Yellowstone and Grand Teton National Parks, more than 80 percent of the letters received supported the removal of snowmobiles from these parks. Moreover, a recent poll conducted by Zogby International found that more than 60 percent of the voting public opposes the use of motorized thriftercraft such as snowmobiles in the National Parks. Enclosed please find public comments on the draft winter use EIS, and the final rule implementing the phase-out. Since these comments support the removal of snowmobiles from Grand Teton and Yellowstone, they are relevant to the SEIS process. We ask that these letters be included in the SEIS administrative record and counted as individual comments supporting the SEIS' 1A Phase-out Alternative.

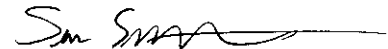
### **Conclusion**

In its Record of Decision signed November 22, 2000, the Park Service concluded that in order to uphold the laws that protect the National Parks, phasing out snowmobile use from Yellowstone and Grand Teton would be essential. Declared by an Act of Congress in 1916, the Park Service's responsibility is to keep national parks "unimpaired for the enjoyment of future generations." Scientific evidence of impairment from snowmobiles is overwhelming. The Environmental Protection Agency reviewed the evidence and pronounced it "among the most thorough and substantial" the EPA has seen in similar planning processes.

Alternative 1A is the only alternative which fully complies with federal mandates such as the Organic Act, minimizes enforcement costs, reduces impacts upon the environment and wildlife, while allowing for historic visitation levels. The SEIS does not contain sufficient information for the Park Service to legally overturn the FEIS original plan to phase out snowmobiles. Rather, the SEIS provides further support that these dirty, dangerous, and

noisy machines should be removed as soon as possible. We urge the NPS to adopt Alternative 1A and uphold its decision to phase out snowmobiles at Yellowstone and Grand Teton National Parks.

Sincerely,



Sean Smith, M.S.  
Public Lands Director

**List of Attachments to Bluewater Network's Comments on SEIS**

- Study: Winter Recreation and Hibernating Black Bears *Ursus Americanus*
- Study: Recent Changes in Population Distribution: The Pelican Bison and the Domino Effect
- Report: Air Quality Concerns Related to Snowmobile Usage in National Parks
- Study: Effect of Snowmobile Use on Snowpack Chemistry in Yellowstone National Park, 1998
- Study: Exposure of Snowmobile Riders to Carbon Monoxide
- Position Statement: American Academy of Pediatrics Snowmobiling Hazards
- Report: Consumer Product Safety Commission Hazard Sketch Snowmobiles
- Study: Snowmobile Contributions to Mobile Source Emissions in Yellowstone National Park
- Study: Snowmobile Impact on Three Alpine Tundra Plant Communities
- Study: Ecological Effects of Snowmobiles
- Study: The Care and Cost of Snowmobile Related Injuries
- Study: Injuries Associated with Snowmobiles, Alaska 1993-1994
- Study: Reaction of Moose to Snowmobile Traffic in the Greys River Valley, Wyoming
- Study: Caribou Reactions to Provocation by Snowmobiles in Newfoundland
- Study: Effects of Disturbance by Snowmobiles on Heart Rate of Captive White-Tailed Deer
- Study: Effects of Snowmobiles on White-Tailed Deer
- Study: Snowmobile Harassment of Mule Deer on Cold Winter Ranges
- Study: Snowmobile Impact on Old Field and Marsh Vegetation in Nova Scotia, Canada
- Report: The Ecological Impact of Snowmobiling in Northern Minnesota
- Study: The Reactions of Muskoxen to Snowmobile Harassment

- Study: Snowmobile Use and Winter Mortality of Small Mammals
- Comments: Polaris Industries' comments on the "Control of Emissions from Nonroad Large Spark Ignition Engines and Recreational Vehicles."
- Comments: Kawasaki Comments on the "Control of Emissions from Nonroad Large Spark Ignition Engines and Recreational Vehicles."
- Comments ISMA Comments on the "Control of Emissions from Nonroad Large Spark Ignition Engines and Recreational Vehicles."
- Advertisement: Mattracks promotional materials
- Table: Total Miles of Snowmobile Trails
- Comments: Public Comments on the DEIS
- Comments: Public Comments on the rule implementing the FEIS
- Report: General Accounting Office Agencies Need to Assess the Impact of Personal Watercraft and Snowmobile Use
- Webpage: Ford XLT 6.8 L Van, Environmental Protection Agency Emission Results for Ford 6.8L van
- Fact Sheet: California Air Resources Board: New Regulations for portable gas cans and gas can spouts
- Federal Register Notice: Environmental Protection Agency: Control of Emissions from Nonroad Large Spark Engines
- Letter: Bluewater Network Letter to Gale Norton regarding Small Business Administration's comments on the NPS phase out of snowmobiles from Yellowstone and Grand Teton National Parks
- Comments: Bluewater Network's Scoping Comments on the SEIS
- Table: Draft Supplement EIS, Materials Presented as New Information
- Petition to Prohibit Snowmobiling and Road Grooming In National Parks



Winter Use Draft SEIS Comments  
Grand Teton & Yellowstone National Parks  
P.O. Box 352  
Moose, Wyoming 83012

Dear Park Service,

The air and noise pollution and the disruption of wildlife currently being caused by snowmobiles in Yellowstone violates the spirit if not the letter of the National Park charter and, frankly, I can't believe that the park service would even consider allowing it. National Parks are among the few places left where both humans and animals can escape the high pitched whine of motors and the stink of exhaust. This is why they were created in the first place and why they remain so popular.

I think your responsibility in this matter is clear and obvious regardless of political pressures and I strongly suggest that you select "Alternative 1a" in the supplemental winter use study for Yellowstone Park.

Yours,

*John Gierach*  
John Gierach  
Editor at Large



megan@friendsofanimals.org (Megan Anne Metzelaar)  
05/29/2002 09:38 AM  
EST

To: grle\_winter\_use\_seis@nps.gov  
cc:  
Subject: Restore Yellowstone in Winter

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

Dear Park Service:

On behalf of Friends of Animals, an international animal protection organization with 200,000 members, I urge you uphold your decision to phase out snowmobile use in Yellowstone and Grand Teton National Parks.

Snowmobiles produce noise and air pollution. They displace and frighten wildlife and disturb animals and birds in their native habitat. Wildlife across the country is being subjected to increased human interference every day; at the very least, our national parks should provide wildlife with a respite and refuge from harmful intrusion.

Snowmobile use has been linked to increased numbers of wild buffalo migrating out of Yellowstone via the groomed trails. As you well know, buffalo who wander out of the park are being subjected to cruel harassment, capture and slaughter by the Montana DOL. There is of course no justification for the DOL's treatment of these animals, but the fact is, when buffalo leave the park they are walking into a death trap. Phasing out snowmobile use may play an important role in reducing the abuse of our precious buffalo at the hands of the DOL.

Very truly yours,

Megan Metzelaar, JD  
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COMMENTS OF The Greater Yellowstone Coalition, Natural Resources  
Defense Council, The Wilderness Society, Natural Trails and Waters  
Coalition, National Parks Conservation Association, Defenders of Wildlife,  
Sierra Club, Jackson Hole Conservation Alliance and Wyoming Outdoor  
Council

on the  
WINTER USE PLAN DRAFT SUPPLEMENTAL EIS for  
YELLOWSTONE AND GRAND TETON NATIONAL PARKS AND JOHN D. ROCKEFELLER JR.  
MEMORIAL PARKWAY

Prepared by Hope Sieck, Associate Program Director, Greater Yellowstone Coalition  
May 29, 2002

*This issue isn't snowmobiling or the snowmobile industry. It's about Yellowstone National Park and preserving the values it represents: wildlife, solitude, vistas, and majesty found in few other places in our nation...If we cannot preserve Yellowstone and the unique experiences it offers, we will have failed future generations...The best choice for Yellowstone under the draft SEIS is Alternative 1a—complete phase-out of snowmobiles.*  
Casper Star-Tribune  
March 7, 2002

#### I. Introduction

We are pleased to submit these comments on the Draft Supplemental EIS (DSEIS) for winter use in Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr., Parkway. We submit these comments also for consideration in the concurrent proposed rulemaking for winter in the parks. We request that the final rule reflect Alternative 1a of the DSEIS. We oppose further delays to eliminating impairment and adverse impact to the parks resources and values. Incorporated herein by reference and attached to these comments are our previous comments on the 1999 DEIS, 2000 FEIS and 2001 Final Rule.

The future of Yellowstone and Grand Teton National Parks is at a crossroads. The choice before the Park

Service is simple: to uphold protections of Yellowstone and Grand Teton from the adverse impacts of snowmobile use or to allow degradation of these parks to the benefit of the snowmobile industry. The ultimate choice will have a profound and far-reaching impact on these and all national parks.

Winter in Yellowstone is a magical time. The park's vast expanse is blanketed in snow and ice. Geysers and hot springs send plumes of steam into the air and shroud trees and wildlife alike in a coat of frost. Bison and elk move slowly along river valleys in search of food; bears hibernate; coyotes and wolves hunt; trumpeter swans and bald eagles depend upon geothermally influenced rivers such as the Madison, Firehole and Yellowstone that stay free of ice. Temperatures on Yellowstone's high plateau are often subzero and nature always takes a toll. Winter is a critical time for wildlife—survival is not guaranteed and existence is at its most difficult. Winter in Yellowstone also presents a unique opportunity in our urbanizing world to be transported back to a time of quiet, filled with wildlife and the splendor of nature.

Congress has always recognized national parks as a unique national resource requiring special protection. The laws designed to protect national parks provide the greatest opportunity this country has to preserve lands, wildlife, and the qualities of peace, quiet, openness and wildness which are becoming all too rare. Yellowstone is indeed a rare and special place.

The last wild bison found refuge in the park at the turn of the century. Today, Yellowstone is the only place in the lower 48 states where all of the native animals present before the establishment of this country still survive. Wolves, bison, bears, elk, bald eagles and other important species thrive alongside remarkable geothermal wonders, majestic mountains, pristine lakes and pure rivers.

It is these irreplaceable and rare attributes that Congress sought to protect when it created Yellowstone National Park in 1872. As the world's first national park, Yellowstone gave birth to the national park idea, a wholly American invention which has now spread throughout the world. Yellowstone's spirit inspired more than 100 countries to create 1200 national parks and conservation preserves. Today, the very foundation upon which Yellowstone and all other parks are built is in question.

130 years ago, as the Senate was debating the formation of Yellowstone National Park as the world's first national park, Senator George Vest of Missouri spoke out, asking his colleagues to imagine a day when the United States would have a hundred million or 150 million people. When that day arrived, Senator Vest told his colleagues, Yellowstone would serve as "a great breathing place for the national lungs." (Freeman Tilden, *The National Parks: what they mean to you and me*, Alfred A. Knopf, New York, 1951.)

Sadly, today instead of serving as a great breathing place for the national lungs, Yellowstone's own lungs are clogged. For half a decade now, fresh air has been pumped into ranger booths at the West Entrance to prevent headaches, nausea, burning eyes and other health problems caused by snowmobile exhaust. However, this effort did not prove enough to protect rangers from carbon monoxide, formaldehyde, benzene and other harmful air pollutants emitted by snowmobiles. This winter, for the first time in history, rangers were forced to wear respirators to endure a work day in Yellowstone without ill effects.

Yellowstone in winter is a far different place than Congress envisioned when it set aside Yellowstone 130 years ago. Instead of embarking on a path to recovery, delays have put off protection of Yellowstone and placed employees and visitors at risk from polluted air, subjected wildlife to continued harassment by snowmobiles, and marred the serenity and beauty of Yellowstone.

New efforts this winter aimed at reducing the impacts of snowmobile use in Yellowstone cost taxpayers more than a quarter of a million dollars. Yet even with mitigation measures including extensive visitor education and increased ranger presence, hundreds of snowmobilers were cited and warned this season for ignoring speed limits and other park rules established to protect public safety and Yellowstone's wildlife. A record number of citations for snowmobile violations were logged this year. Videographers and scientists recorded snowmobiles pushing park wildlife from its natural habitat at great energetic cost. Visitors found it difficult to hear the hiss and splash of Old Faithful geyser and other natural sounds within the park.

because of a nearly constant whine and roar from snowmobile engines.

Instead of a peaceful, quiet winter wonderland, visitors today are welcomed by extreme noise, choking pollution, noxious odors and rangers in respirators. This is far from the Yellowstone that Congress envisioned 130 years ago and far from the Yellowstone that the American public expects and deserves.

Now, despite the protective decision made in 2000 by the Park Service to phase out snowmobiles from Yellowstone and Grand Teton National Parks because of the impairment to park resources and values the machines cause, this new Park Service planning process is underway. The Supplemental EIS process is costing taxpayers \$2.4 million and has delayed protection of Yellowstone by sixteen months already. The Draft Supplemental EIS (DSEIS) reveals that no information provided in the new process would in any way alter the Park Service's decision. All of the "new" information was analyzed by the Park Service previously and found to support the original decision to protect the parks from snowmobile damage. In light of the law, science and public support, any reversal of the important and long overdue November 2000 Park Service decision to remove snowmobiles from Yellowstone and Grand Teton National Parks would signal an attempt to contravene the very meaning and mission of what national parks mean under law and to the American public.

## II. National Park Service Primary Mandate to Protect Park Resources and Values

The Park Service duty under governing law, regulation and policy is to assure that national park resources are protected in an unimpaired state for the benefit and enjoyment of this and future generations. The NPS mission was clearly elucidated by Congress and has been reaffirmed over the years. NPS has an affirmative responsibility to implement management actions that ensure full compliance, or go well beyond simple compliance, with law, regulation and policy now and in the future.

## III. 2000 ROD and 2001 Rule Clear: Snowmobiles Impair Park Resources and Values, Violate NPS Duty Under Guiding Law, Regulation and Policy

Beginning more than a decade ago, the Park Service began to study the impacts of snowmobile use on park resources and values. Through comprehensive analysis during a three year NEPA process, the Park Service determined that snowmobile use in Yellowstone, Grand Teton, and John D. Rockefeller Jr. Memorial Parkway causes unacceptable damage to park resources including:

*...wildlife, air quality, and natural soundscapes and natural odors. Further, it adversely impacts the enjoyment of those values and resources by other visitors. The impact on people who may visit the three parks once or twice in a lifetime, and who seek the resources and values for which the parks were created, may be adversely and irretrievably affected (NPS Record of Decision, November 2000).*

The Park Service found that snowmobile use in Yellowstone and Grand Teton National Parks impaired park resources and values. This finding led the Park Service to act to remove the impairment caused by snowmobile use and put the parks on a path to restoration. In November 2000, the Park Service made the final decision to phase out snowmobiles from Yellowstone and Grand Teton National Parks.

*The use of snowmobiles and snowplanes at present levels harms the integrity of the resources and values of these three parks, and so constitutes an impairment of the resources, which is not permissible under the NPS Organic Act. In YNP, the impairment is the result of the impacts from snowmobile use on air quality, wildlife, the natural soundscape, and opportunities for enjoyment of the park by visitors. In GTNP, the impairment is the result of the impacts from snowmobile and snowplane use on the natural soundscape and opportunities for enjoyment of the park by visitors. (Record of Decision, November 2000)*

In Yellowstone and Grand Teton National Parks, the highest standard of protection—Organic Act prohibition on impairment—is violated by snowmobile use. That finding of impairment, combined with the finding that snowmobile use in Yellowstone and Grand Teton National Parks also conflicted with the directions given by Executive Orders 11644 and 11989, the Clean Air Act and NPS Management Policies, guided the Park Service to its final decision. The Park Service found a solution to the problems caused by snowmobile use in the parks in an already

existing mode of winter transportation: multi-passenger snowcoaches. The decision to phase out snowmobiles outlined a plan to increase the number of snowcoaches so that the same number of winter visitors could continue to enjoy Yellowstone, with far less impact. A snowcoach transit system "would reduce adverse impacts on park resources and values, better provide for public safety, and provide for public enjoyment of the parks in winter." (Final Rule, January 2001). The Park Service outlined a plan to make the snowcoach system a reality through an implementation plan and a three year phase-in period in the Record of Decision and final rule.

It should be noted that the 2000 Decision and 2001 Rule are still in effect. NPS failed to implement the snowmobile limits set out in the rule for this winter, and instead has allowed continued impairment and adverse impact to park resources and values in violation of the Final Rule.

## IV. EPA Comments Support 2000 Decision and 2001 Rule

EPA, a cooperating agency, recommends upholding the 2000 Decision and 2001 Rule to protect the parks based on applicable science and law. This reconfirms the agency's comments on the DEIS of 1999, which supported Alternative G.

*The analysis presented in this EIS clearly indicates FEIS Alternative G would provide the best available protection to human health, wildlife, air quality, water quality, soundscapes, visitor experiences, and visibility while maintaining motorized and non-motorized winter access to these Parks. We are confident that Alternative G will fully comply with all applicable environmental regulations, policy and Executive Orders. (EPA Comments to NPS on DSEIS, April 23, 2002).*

## V. The Legal and Policy Framework for the Preeminent Park Responsibility: Protection of Resources

Yellowstone and Grand Teton National Parks must comply with the Organic Act, the Yellowstone Act, NPS regulations, NPS Management Policies and Executive Orders 11644 and 11989. It is clear that any use of snowmobile use in the parks runs counter to existing laws and regulation. The purpose of the National Park System is clear: to protect park resources and ensure that visitor use does not cause impairment.

### A. The Highest Standard: The Organic Act of 1916

Upon Yellowstone's creation in 1872, Congress declared it to be "a public park or pleasuring ground for the benefit and enjoyment of the people." (16 U.S.C. §21). Such public benefits were not without limits, as Congress directed the Secretary to make regulations providing for "the preservation, from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders, within the parks, and their retention in their natural condition." Id at §22.

The National Parks are intended to preserve the nation's treasures in perpetuity. This can only be accomplished by preserving and maintaining each park's special features and the ability of citizens to enjoy those features. When it created the National Park Service in 1916, Congress gave the agency a clear mission:

*...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (NPS Organic Act)*

Congress reaffirmed and further clarified the Park Service mission in the 1978 Redwood Act, stating:

*...the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established....*

The National Park Service Organic Act, passed in 1916, (16 U.S.C. §1 et seq) sets forth the purpose of the NPS as "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The intent of Congress was to preserve the scenery, natural objects and wildlife of the National Parks. (The legislative history of the Organic Act provides additional support for the preservation mandate. In a House Report on the Act, for example, the overriding purpose of the bill was stated as to preserve "nature as it exists." (H. Rep. No. 700, 64<sup>th</sup> Congress, 1<sup>st</sup> Sess. 3 (1916)).

The fundamental purpose of parks also includes "enjoyment" of park resources. This enjoyment is meant broadly to include people who visit parks as well as those who derive benefit from simply knowing that our national parks exist. The courts have time and again interpreted the Organic Act as holding conservation of park resources preeminent over enjoyment of them; visitor use must not cause impairment of park resources and values.

Congress provided the National Park Service with the discretion to manage national parks, but limited that discretion by the requirements of the Organic Act that park resources and values be left "unimpaired" for future generations. This duty to avoid impairment establishes the primary responsibility of the National Park Service. "The impairment of park resources and values may not be allowed by the Service unless directly and specifically provided for by legislation or by the proclamation establishing the park." (NPS Management Policies at 1.4.4). The Park Service has an affirmative duty to prevent degradation of park resources and values. "NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values." (NPS Management Policies at 1.4.3). Impairment is an impact which affects a resource or value that is "necessary to fulfill specific purposes" identified in formation of the park or "key to the natural and cultural integrity of the park or to opportunities for enjoyment of the park". (NPS Management Policies at 1.4.5). The "park resources and values" that fall under the impairment standard include scenery, wildlife, natural soundscapes and smell, and all natural process and features. Also not to be impaired is "the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system." (NPS Management Policies at 1.4.6).

#### **B. Recreation vs. Transportation in Parks: A Critical Distinction Upheld by Courts**

At issue in Yellowstone is a choice of how best to move visitors through the parks in winter. Fortunately, the parks are not yet at a stage where limiting visitor numbers is necessary to protect resources. Indeed, it is not the number visitors to the parks in winter that is the problem; rather, it is the mode of access used by visitors that is the source of damage to the parks. The 2000 NPS decision to shift winter access to multi-passenger snowcoaches will provide full, and enhanced, visitor access with exponentially less impact per visitor.

In the DSEIS NPS makes clear the goal of providing visitor access in a manner that does not impair visitors' ability to experience park resources:

Each alternative provides, at a minimum, for current levels of visitation. Alternatives 1a and 1b provide this visitation by use of snowcoaches throughout all areas that are currently accessible by oversnow motorized means in and to YNP. "The mode of access is a function of visitor preference for a certain type of travel experience, unrelated to the intrinsic values of the parks. . . . Under NPS policies, visitor experience is more associated with the quality of resources and values in the park setting, and less associated with the mode of transport used to access them." (DSEIS p. 252)

The 2000 NPS decision to transition winter access to a snowcoach system places Yellowstone and Grand Teton in good company. Seventy-four national parks have successfully implemented some form of mass-transit program. NPS is and should continue to be a leader in promoting clean, quiet and affordable modes of group transportation which are protective of the natural qualities of the parks. NPS policy on use of motorized equipment requires that "Where such use is necessary and appropriate, the least impacting equipment, vehicles, and transportation systems should be used. . . ." (NPS Management Policies at 8.2.3). As a transportation system for the parks, snowmobiles clearly fail to meet policy standards. And as a form of recreation, the law is as clear: damaging forms of recreation have no place in national parks.

The District Court of Utah recently clarified that the Park Service is not in the business to provide recreational opportunities if those recreational pursuits contravene NPS policy and the Organic Act. Protection of the resource comes first and all visitor access must be in harmony with preservation. (*Southern Utah Wilderness Alliance v. Dabney* (1998 WL 703956 (D. Utah)). At issue was the "right" of four-wheel drive enthusiasts to recreate in sensitive riparian areas in Canyonlands National Park. The Court based its decision to deny continued access on the Organic Act.

The relevant provision of the Organic Act provides that the Park Service is to "regulate the use of" national parks by means that conform to their "fundamental purpose", namely: "to conserve the scenery and natural historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations". (Organic Act (16 U.S.C. § 1a-1).

The Court went on to clarify the oft-cited Organic Act notion of "visitor enjoyment"; user groups attempt to broaden the concept of "visitor enjoyment" to denote a right to recreate in or access the parks in any way seen fit. The Court disagreed. "[V]isitor enjoyment" as used in the statute refers to visitor enjoyment of park scenery, wildlife, and natural and historic objects that are to be preserved. As used in this sense, visitor enjoyment does not refer to visitor enjoyment of outdoor recreational activities. Opportunities for outdoor recreation are provided on lands managed by the Bureau of Land Management and the Forest Service. . . . [G]iven . . . the availability of less-invasive forms of access, permanent impairment . . . in order to permit the continued use [of four wheel drive vehicles in Salt Creek Canyon] cannot be reconciled with the Organic Act's overarching goal of resource protection." (*Southern Utah Wilderness Alliance v. Dabney* (1998 WL 703956 (D. Utah)).

#### **C. NPS Regulations Are Protective and Presumptive Against Snowmobiles**

Snowmobiles are generally prohibited in national parks except when "their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and will not disturb wildlife or damage park resources." (36 CFR 2.18(c))

When such damage is known to occur, the Superintendent is authorized to "regulate, restrict, or close a portion or all of a Park area to all public use if such action is necessary to protect the environment or scenic values of the Park, [and to] protect natural resources. . ." 36 C.F.R. §1.5.9a) (1).

In issuing revised snowmobile regulations in 1979, the Park Service continued to recognize that it cannot permit snowmobiling in any areas where it would conflict with the agency's overall mandate. Furthermore, even where such use may be consistent with Park Service regulations, the Park Service determined that, given the inevitable adverse impacts of these machines, if "equally desirable [snowmobiling] opportunities exist on adjacent lands," then "snowmobile use is more appropriate on the adjacent lands which do not have the specific preservation mandate of the National Park Service." (44 Fed. Reg. 47,413 (1979)).

#### **D. Executive Orders 11644 and 11989 Prohibit Adverse Snowmobile Impacts**

In the 1970s, with off-road vehicles causing increasing damage to public lands across the nation, Presidents Nixon and Carter signed Executive Orders 11644 and 11989 (respectively). The first required that the Park Service:

*ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of these lands...*

Executive Order 11644, issued in 1972, directs agency officials to specify, through regulation, the areas and trails on public lands on which ORV use will be permitted. Those areas where ORV use is permitted will be based on, among other things, "the protection of the resources of the public lands." Id at §3(a), and shall "be located to minimize harassment of wildlife or significant disruption of wildlife habitats." Id at §3 (a) (2). Within national parks, such trails shall only be designated "if the respective agency head determines that off-road vehicle use in such locations will not adversely affect their natural, aesthetic, or scenic values." Id at §4. The EO also requires agencies to establish a mechanism to monitor ORV use and impacts and to respond appropriately to such information. Id at §8.

In May of 1974, Yellowstone National Park designated trails upon which snowmobile use was permitted (39 Fed. Reg. 16151). The designated trails, the selection of which was allegedly "guided by the criteria in sections 3 and 4 of EO 11644" consisted of nearly all of the unplowed roadways.

In 1977, EO 11644 was amended by EO 11989. The second order directed that when the Park Service determines:

*that the use of off road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands (it shall) immediately close such areas or trails to the type of off-road vehicle causing such effects.* (EO 11989 42 Fed. Reg. 26959(1977) reprinted in 42 U.S.C. §4321). (emphasis added)

Snowmobile use in Yellowstone and Grand Teton National Parks violates the Executive Orders by clearly causing "adverse effects". The closure authority under the EO must be invoked when the agency head has determined that ORV use may or will cause adverse environmental impacts. In order to comply with the Executive Orders, NPS must uphold the decision to phase out snowmobiles

#### **E. NPS Policy Requires Highest Protection and Restoration of National Parks**

NPS Management Policies of 2001 cover all of the impact areas addressed in the FEIS and DSEIS. The "General Management Concepts" of the policies build upon the overarching policy that "preserving park resources and values unimpaired is the core, or primary, responsibility of NPS managers." (NPS Policies at 4.1). To fulfill this primary responsibility, it is necessary that "[i]n cases of doubt as to the impacts of activities on park natural resources, the Service will decide in favor of protecting the natural resources." (NPS Policies at 4.1). Moreover, NPS is directed to go beyond protection to restore natural systems. "The Service will seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated." (NPS Policies at 4.1.5). This restoration may be accomplished through means such as "removal of contaminants" and "restoration of natural soundscapes". (NPS Policies at 4.1.5). Specific policies, impacts and findings will be discussed in the impact topic sections below.

#### **VI. 2000 Decision and 2001 Rule Based on Comprehensive Public Process**

The press release from the Secretary of Interior's Office announcing the DSEIS refers to the decision to phase out snowmobiles as "rushed rulemaking". In reality, the Park Service process which led to a November 2000 decision to phase out snowmobiles included more than ten years of scientific study (including numerous site-specific studies in the parks), three years of NEPA analysis and public comment, and 22 public meetings and hearings.

The public opportunity to engage in the winter use planning for YNP and GTNP was both extensive and comprehensive. In July, 1999 – after ten years of study and research – the National Park Service released its draft EIS for public consideration and comment. During the EIS and rulemaking processes, there have been four separate opportunities for the public to comment, including 22 hearings in the region and across the nation. Locally, public hearings were held in towns such as West Yellowstone, Livingston, Cody, Jackson, and Idaho Falls. The public clearly welcomed the opportunity to comment on the Park Service's various proposals to protect America's oldest national park. The agency received over 70,000 individual comments.

At each stage of the input process, support for phasing out snowmobile use in the parks became more emphatic. Reacting to the DEIS, the greatest number of citizens who commented favored an end to in-park snowmobiling. This perspective grew to a two to one majority in the fall of 2000 when the public commented on the FEIS – and then to a four-to-one majority favoring a snowmobile phase out in early 2001 as the final rule went into the Federal Register. More recently, in October 2001, the public sent the same clear message: 82 percent commented in favor of the Park Service decision to phase out snowmobile use in the parks over a three-year period.

A concern about the DSEIS comment period is the solicitation of multiple comments by the snowmobile industry and its allies. Copies of such solicitations will accompany these comments under separate cover. We trust that NPS will ensure that multiple comments are sorted out during the content analysis. In future comment periods, NPS may want to make clear to the public the guidelines of NEPA comment submission.

#### **VII. 2000 Decision and 2001 Rule Based on Best Information Concerning Snowmobile Technology**

The EIS forming the basis of the 2000 Decision and 2001 Final Rule was based on thorough analysis of the best available snowmobile technological information. There is no new information to cause a change the analysis or findings of the 2000 decision and 2001 rule.

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The claimed existence of additional information concerning snowmobile air and noise emissions served as a chief reason for the new process. Before the SEIS process was initiated, the Park Service, in a February 5, 2001 letter to Arctic Cat CEO Christopher Twomey, asked for "results of last year's use and what improvements, if any, were made for this year's model. Specifically, if you have any scientific reports on noise and emissions from this year's four-stroke snowmobiles that you can share with us, we would appreciate copies of them. If you do not have these scientific reports, please refer us to the appropriate contact." (emphasis added).

The Park Service received no answer to this information request. Instead, the International Snowmobile Manufacturers Association (ISMA) pressed on with litigation, stating that in fact new information did exist. According to the settlement agreement, ISMA had to provide any new information to the Park Service by July 30, 2001. ISMA did not adhere to this court-ordered deadline, and instead submitted an information packet nine days later, on August 8, 2001. ISMA stated that "the enclosed information is what is currently available and releasable".

The information submitted did not include any scientific analysis or hard data. Instead, the submission was comprised of assertions of technological improvements that are not backed up by information concerning how those assertions were obtained, under what conditions, or if they are replicable.

ISMA failed to provide any relevant data until later October 2001 (following repeated requests by NPS to fulfill their end of the settlement agreement). The data that ISMA eventually did provide was found to be already analyzed within the parameters of the FEIS. Descriptions of the "new" information are found in the DSEIS and the internal review draft. Each description dismisses the "new" information as not providing additional data or rationale for new analyses. The language of the internal review draft is more critical of this lack of new information than language in the DSEIS.

Although the snowmobile industry reports that it is on the threshold of mass-producing much cleaner and much quieter machines – it says something entirely different to the EPA. In letters submitted to the EPA, the industry has argued for a weak emission standard. Specifically, the manufacturers have said it will not be until 2010 (at the earliest) that they can reduce carbon monoxide emissions by 50 percent. The manufacturers are also resisting labeling of their machines, which would leave the Park Service unable to distinguish between more-polluting and less-polluting snowmobiles.

EPA, a cooperating agency in the DSEIS process, has stressed to the Park Service and the other cooperating agencies that it is unclear when snowmobiles will be regulated by EPA, and if they are, by how much. Any EPA promulgated regulation will take 6-10 years to be fully implemented on the ground—this time lag is yet another factor that the Park Service analyzed in the EIS and found insufficient to address impairment issues and other impacts. Despite this information from EPA, the State of Wyoming's Alternative 2 relies heavily on early implementation of the anticipated EPA emissions standards.

#### **VIII. Improved Snowmobile Technology Fails to Address Snowmobile Impacts to Air Quality and Natural Soundscapes**

In the "new" information submitted to NPS, Arctic Cat reported "that exhaust emissions have been cut by more than one-half for CO and three-quarters for HC". These types of emissions levels, and stricter, were analyzed by the Park Service in the Winter Use EIS and found insufficient to address issues of park impairment. Polaris reported that their "preliminary emissions data" show that the four-stroke machine will achieve "the 30% exhaust emission reduction of both HC and CO proposed by the industry to EPA for fleet average implementation in 2006." The Park Service went far beyond the 30% HC and CO emission level reductions advocated for by the snowmobile industry in its previous analysis and found that such reductions failed to address issues of impairment.

"Cleaner and quieter" snowmobiles were examined in several of the alternatives in the Draft and Final EIS. For example, the Final EIS provides analysis of improved snowmobile technologies in Alternative D. "In alternative D only 10% ethanol-blend fuels and bio-based lubricants would be sold in the parks. By

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winter 2008-2009, only snowmachines that have been certified to meet stricter emissions standards would be allowed in the parks. Oversnow vehicle emission rates would 40% of the baseline CO emission rate, 75% of the baseline PM<sub>10</sub> rate, and 70% of the baseline hydrocarbon emission rate." (FEIS p. 334).

These numbers were generated with the assistance of the Montana Department of Environmental Quality using best professional estimations of the then-current capacity for technological improvements. Today, with the emergence of four-stroke snowmobile technology, it is likely that professional judgment would yield still stricter emissions control estimates for what is technologically feasible. Despite the snowmobile industry's assertions regarding redesigned machines and improved emissions, industry numbers and projections submitted for the SEIS process remain well below what the Park Service already analyzed and determined insufficient for protection of park resources.

For example, in the area of noise emissions and impact on natural quiet, the Park Service analyzed a 60dBA level at 50 feet as a "clean and quiet" level for all oversnow vehicles. The FEIS noted that the alternative for quieter snowmobiles yielded a substantial improvement over existing condition, but that the noise levels of the "cleaner and quieter" technology remained greater than alternative G, the preferred snowcoach alternative. (FEIS p.350). This alternative and all of the FEIS alternatives allowing continued snowmobile use were found to impair park resources. In the DSEIS snowmobile alternatives, noise emissions remain above 70dB (Alternative 2) or are undefined (Alternative 3), far above noise levels analyzed in the FEIS and found insufficient to comply with NPS law, regulation and policy.

#### IX. Improved Snowmobile Technology Fails to Address Snowmobile Impacts to Wildlife

In relation to wildlife impacts, the Park Service concluded that "[e]ven with technical advances in snowmobiles, the impacts of snowmobile use on wildlife, especially ungulates using groomed routes, constitutes disturbance and harassment at a time when individual animals are particularly challenged for survival." (Record of Decision).

The agency summarized:

*Cleaner, quieter snowmobiles would do little, if anything, to reduce the most serious impacts on wildlife, which are caused more by inappropriate use of snowmobiles than by the machines themselves. Quieter snowmobiles are still noisy, and are audible at greater distances than 4-track conversion snowcoaches. Since snowcoaches carry many passengers and snowmobiles only one or two, snowcoaches can accommodate the same level of overall winter visitation with far fewer noise impacts on the natural soundscape and other visitors than even quieter snowmobiles.* (Record of Decision).

#### X. NPS Analyzed Alternatives Examining Improved Snowmobile Technologies for the 2000 Decision and 2001 Rule and Found Them Insufficient to Protect Park Resources

In the EIS leading to the 2000 Decision and 2001 Rule, NPS thoroughly analyzed the impacts of new technology on wildlife, air quality, natural soundscapes and visitor experience in Yellowstone and Grand Teton national parks. The range of alternatives presented in the DEIS and FEIS analyzed continued snowmobile use and redesigned snowmobile design. Six of the seven alternatives examined continued snowmobile use in the parks. Continued snowmobile use was analyzed in several contexts: with minimal mitigation measures in the no action alternative A; in thorough analysis of potential improvements to snowmobile technology in alternatives B, D and F; to the use of guided tours and closure of routes in alternative F. The Park Service thoroughly analyzed redesigned snowmobile technology in the Draft and Final EIS based on scientific information and modeling.

The decision makers in 2000 and 2001 had the following tools—all of which were fully analyzed in the FEIS—to choose from: best available technologies, lower emissions standards, guided-only snowmobile tours; vehicle caps; adaptive management, education, enforcement, and carrying capacity. NPS laid out the most protective snowmobile alternative in FEIS Alternative F. Even this alternative was found insufficient to protect park resources. The Park Service concluded that "[t]he continued use of snowmobiles as provided in the alternatives studied...is found to be inconsistent with the health and integrity of resources existing in the three park units." (Record of Decision).

#### XI. DSEIS Reconfirms 2000 Decision to Phase Out Snowmobiles: Nothing New to Warrant Different Outcome

The DSEIS contains nothing new regarding the major components of alternatives considered. The DSEIS makes clear that there is no new information or analyses that justify reversing the Yellowstone rule. NPS admits to this lack of difference between the FEIS and DSEIS: the "analysis and the alternatives in the DSEIS are not vastly different than those in the FEIS. What appears to have changed is the public's perception regarding new technology, or its willingness to consider its use, and industry's willingness and ability to produce it." (DSEIS p. 16) National park compliance with laws, regulations and policies is not meant to be governed by public perception or industry whim. The lack of new information in the DSEIS leaves NPS with only one choice: to uphold the 2000 Decision and 2001 Rule.

#### XII. Impacts to Park Resources in FEIS and DSEIS Snowmobile Alternatives Violate NPS Legal Requirements

NPS found that snowmobiles impair park air quality, natural soundscapes, wildlife and visitor experience. Thorough analysis in the EIS indicated that FEIS Alternative G "would provide the best available protection to human health, wildlife, air quality, water quality, soundscapes, visitor experiences, and visibility while maintaining

##### A. Air Quality

##### 1. Legal, Regulatory and Policy Requirements

Requirements under the Clean Air Act and NPS policies contributed to the Park Service's decision to phase-out snowmobiles from Yellowstone. Yellowstone and Grand Teton's exceptional air quality—essential to fulfilling the Parks' mission and mandates—is threatened by snowmobile use.

Through the Clean Air Act, Congress required special protections for lands where air is clear and pure, designated as Class I airsheds. Yellowstone and Grand Teton are both Class I airsheds. The Clean Air Act states that the National Park Service, as a federal land manager, has "an affirmative responsibility to protect air quality related values, including visibility, from the adverse effects of air pollution in areas that are designated as "Class I".

There are 48 Class I areas that are part of the National Park System; their management is governed by the Prevention of Significant Deterioration program (PSD). Congress intended that these areas be afforded the greatest degree of air quality protection and specified that only very small amounts of air quality deterioration from new or modified major stationary sources be permitted.

One purpose of this Prevention of Significant Deterioration (PSD) program is "to preserve, protect, and enhance the air quality in national parks." (42 U.S.C. §7401 *et seq.*) (emphasis added). "These policies require managers to assume an aggressive role in promoting and pursuing measures to safeguard air quality and related values from the adverse impacts of air pollution" (Flores and Maniero, NPS 2000).

The NPS is mandated through both its own 1916 Organic Act (16 U.S.C. §1), the Clean Air Act (42 U.S.C. §7401 *et seq.*) and Executive Order 12088, as amended, to protect air quality in National Parks. "Accordingly, the Service will seek to perpetuate the best possible air quality in parks" because of its critical importance to "preserve natural resources and systems" and "sustain visitor enjoyment, human health, and scenic vistas". (NPS Management Policies of 2001 at 4.7.1) "The Service will assume an aggressive role in promoting and pursuing measure to protect values from the adverse impact of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Service will err on the side of protecting air quality and related values for future generations." (NPS Management Policies of 2001 at 4.7.1)

The Park Service's 2001 decision to phase-out snowmobiles was required to comply with the Clean Air Act, Organic Act and NPS Management Policies. That decision ensured that air quality, and visibility, in

Yellowstone and Grand Teton National Parks would meet and go beyond existing legal standards. A phase out of snowmobiles is the only way for the parks to meet the affirmative requirements of Class I airshed standards.

## 2. Air Quality Impacts of Snowmobiles

Although each year in Yellowstone, one million automobiles outnumber the 75,000 snowmobiles sixteen to one, snowmobiles contribute up to 68 percent of the carbon monoxide pollution and as much as 90 percent of the hydrocarbon pollution in the park.

Snowmobiles degrade air quality everywhere they are used. Even a small group of snowmobiles produce extremely high levels of pollution. Due to the popularity and proliferation of snowmobile use in West Yellowstone, NPS conducted air quality studies under various conditions at the West Entrance. The park used stationary and mobile testing apparatus in 1995 and 1996, focusing on carbon monoxide (CO) and particulate matter concentrations at ground level. Preliminary results indicate that CO levels exceed federal and state ambient air quality standards at certain times.<sup>1</sup> In fact, a reading of 36 ppm in 1996 was the highest concentration recorded for CO nationwide, including cities with notoriously high CO levels such as Los Angeles and Denver. Results from both years demonstrate a positive correlation between snowmobile density and high CO levels. CO levels in Yellowstone have also exceeded hourly standards.

The failure to act immediately to halt snowmobile emissions violates the parks' duty under the Clean Air Act and National Park Service Management Policy. Snowmobile emissions at levels damaging to public and employee health and degrading to the parks' air quality have been occurring for years. Carbon monoxide levels in the park currently risk exceeding NAAQS and have exceeded MAAQS and NAAQS in the past. The highest carbon monoxide levels in the nation were recorded at Yellowstone's West Entrance during winters in the 1990s. This directly violates NPS responsibility to ensure the quality of Class I areas. NPS must act immediately to ensure compliance with the Clean Air Act and act affirmatively to restore the Class I airsheds.

## 3. Only Alternatives G and 1a Ensure Protection of Air Quality in Parks

NPS found that only Alternative G, a snowcoach only system, would ensure compliance with air quality and visibility standards. All of the alternatives that allowed continued snowmobile use placed NPS at risk of violation of the Clean Air Act. The DSEIS confirms those findings. The DSEIS shows that it is doubtful whether Alternatives 2 and 3 would ensure compliance with the Clean Air Act and other NPS responsibilities to ensure levels of air quality that do not adversely affect visibility or human health.

The DSEIS shows without doubt that Alternatives 2 and 3 would fail to uphold NPS' affirmative duty to protect and restore the air quality of Class I areas by placing the park at risk of violating Montana and national ambient air quality standards, particularly in initial years of implementation. NPS must take immediate action to comply with and exceed the requirements of the Clean Air Act, regulations and policies and policies by implementing the alternative most protective of air quality. There is no doubt that upholding the 2000 Decision and 2001 Rule would provide the best protection for park air quality.

## 4. DSEIS Fails to Analyze Critical Air Quality Information

The DSEIS fails to analyze several components key to a full understanding of air quality in the parks. First, NPS must complete a PSD increment analysis for particulate matter, both PM10 and PM2.5. EPA has suggested such an analysis for several years. It must be accomplished to fully understand the impacts of snowmobile pollution on the parks' Class I airsheds.

Second, visibility monitoring should be completed. Based on anecdotal, video and photographic evidence, visibility is frequently impaired in the park in winter. Further based on this evidence, visibility impairment is highly variable based on wind, temperature and other climatic factors. As a result, visibility impairment occurs on low use days including those with snowmobile numbers below the level of caps suggested in the DSEIS.

Alternative 2 relies on the promulgation of EPA regulations of snowmobile emissions. As discussed above,

EPA regulations will not be fully implemented until at least 2010 and snowmobile manufacturers are actively opposing meaningful reductions in snowmobile pollution. Alternative 2 relies upon NPS to apply EPA regulations in the parks prior to 2010. Such action extends beyond NPS authority and jurisdiction and places the analysis of Alternative 2 in doubt.

Alternative 3 relies upon vaguely defined "best available technology" for snowmobiles. Best available technology is continually evolving. Would this trigger new NEPA analysis? Moreover, what is best available technology today might be the best ever achieved. Technology could backslide if market forces do not encourage it: how would NPS handle a devolution in best available technology that had been committed to in name only? Modeling in the DSEIS is based on 4-stroke Arctic Cat technology, which uses an automobile engine and is cleaner than other 4-stroke motors. A commitment to 4-stroke technology as "best available technology" would be fraught with uncertainty about impacts and outcomes. The vagaries of "best available technology" reduce the ability of the public to understand Alternative 3 and leave little assurance that park resources would be protected under Alternative 3. Finally, it must be made clear to the public that even if compliance with MAAQS and NAAQS could be guaranteed, that alone does not ensure that the parks will meet visibility or health standards.

## 5. DSEIS Utilizes Flawed Assumptions of Snowcoach Technology

Finally, the DSEIS undertakes a false comparison between snowcoaches and snowmobiles. Risk of perpetuating this false comparison is elevated by the State of Wyoming's study of snowcoach emissions (performed by SWRI) and NPS' stated intent to consider this report further in FSEIS analysis.

The SWRI report has several major flaws. First, snowcoaches were tested under open loop operation. This type of operation is rare; SWRI admits in the report that it is unknown what percentage of time snowcoaches operate in open-loop versus closed-loop. This lack of basic information necessary to calculate emission is grounds for dismissing all of the results regarding snowcoach emissions. Second, snowcoaches are assumed to run with only six passengers, while the information for the operator who provided the information indicated that seven passengers is average. Snowcoaches should be measured at full load, since that would be a goal of a multi-passenger transit system. Finally, all types of snowcoaches should be tested to provide a sense of the options for a snowcoach system.

The DSEIS has focused entirely on attempting to delineate a "best available technology" for snowmobiles. Nearly \$3 million of taxpayer dollars has been spent in that endeavor. As discussed above, the information received from the snowmobile industry and the analysis of BAT in the document leave much to be desired. Even more critical, however, is the omission of discussion of best available technology for snowcoaches. Failure to present such an analysis prevents the public from fully understanding the choice at hand and unfairly attempts to skew the document in favor of snowmobiles. This attempt fails, as snowcoaches are found by the DSEIS analysis to be most protective of park resources and values, but nevertheless this "apples to oranges" comparison must be rectified. An accurate sense of best available snowcoach technology will likely change air quality modeling outcomes.

Best available snowcoach technology should be based on NPS' own documents regarding expansion of the snowcoach fleet. In a request for information from vehicle manufacturers, NPS outlined parameters for snowcoaches that included: emission levels at least as low as a modern gasoline-powered van with current emission controls set up to operate as a snowcoach; alternative fuel capabilities; and increased fuel efficiency. In addition to these parameters, best available technologies from companies that construct snowcoach type vehicles should be analyzed. For example, Kassbohrer, builder of Piston-Bully snowcoats, makes diesel-powered vehicles that operate indoors with emissions lower than California's lowest emissions vehicle requirements (Pers. Comm. Hendrik Grobler, CEO, Kassbohrer; for more information, contact U.S. representative John Gilbert, info@katyph.com). This information makes clear that NPS has failed to adequately analyze best available snowcoach technology. This failure calls into question the DSEIS air modeling. The FSEIS should correct this problem and present the best available snowcoach technology.

**6. DSEIS Alternative 1a Provides Best Compliance with NPS Regulations and Policy**

Upholding the snowcoach decision would "improve air quality in the parks more than the other alternatives." (DSEIS at x). In the study's summary, Table S-2 reveals that Alternative 2, backed by the snowmobile industry, would emit three times more carbon monoxide and seven times more hydrocarbons into the air of Yellowstone and Grand Teton National Parks than snowcoach access would produce. "The lowest CO, PM<sub>10</sub>, NO<sub>x</sub>, and HC emissions occurred in alternative 1b, year 3 and beyond scenario." (DSEIS Table 73, p.203). And, "[r]elative to the existing condition, alternatives 1a and 1b would have major beneficial impacts on air quality." (DSEIS p.205)

**B. Health and Safety****1. Human Health Risks Associated with Snowmobile Exhaust**

The vast majority of snowmobiles are powered by two-stroke engines. These engines create dangerous levels of airborne toxins including nitrogen oxides, carbon monoxide, ozone, particulate matter, aldehydes, 1,3 butadiene, benzenes, and extremely persistent polycyclic aromatic hydrocarbons (PAH). Several of these compounds are listed as "known" or "probable" human carcinogens by EPA. Benzene, for instance, is a "known" human carcinogen. And several aldehydes including butadiene are classified as "probable human carcinogens." All are believed to cause deleterious health effects in humans and animals well short of fatal doses (EPA 1993).

Dangerous levels of carbon monoxide (CO) and particulate matter (PM) are also of great concern. CO is extremely dangerous to humans, and particulate matter is a recently confirmed human carcinogen by the Environmental Protection Agency. Snowmobiles emit dangerously high levels of carbon monoxide. A study conducted for the National Park Service in 1997 concluded that a single snowmobile produces 500-1000 times more carbon monoxide than a 1988 passenger car (Fussell-Snook 1997). Notably, comparisons to a current model-year passenger vehicle would increase this figure significantly.

Two-stroke engines also discharge 25-30% of their fuel mixture, unburned, directly into the environment. Unburned fuel contains many toxic compounds including benzene, toluene, xylene and the extremely persistent suspected human carcinogen MTBE. Two-strokes are one of the largest unchecked sources of pollution nationwide. Extensive information is available on two-stroke engine emissions and the direct impacts to human health and air quality.

For six years, the Park Service has pumped fresh air into entrance booths to alleviate employee health problems caused by snowmobile exhaust. Visitors, too, must breathe the same polluted air, and many complain of the same symptoms as employees. Headaches, nausea, burning eyes, and more: the symptoms of carbon monoxide poisoning are found in park employees subjected to high levels of exhaust. This year, Park Service employees were outfitted with respirators to protect them from high levels of carbon monoxide, benzene and formaldehyde. An Occupational Safety and Health Administration inspection in February 2000 found higher than recommended levels of these pollutants. The Environmental Protection Agency noted that human health issues relating to air quality was a concern that needed to be addressed by the Park Service in its decision.

The blue haze found along snowmobile corridors, trailheads and gas stations contains not only dangerous levels of airborne toxins, but can lead to the formation of additional ground level ozone from the photochemical reaction of released nitrogen and hydrocarbons. Health risks associated with exposure to smog and nitrogen include respiratory complications such as coughing, chest pain, heart problems, asthma, concentration lapses and shortness of breath. Elderly individuals and children are particularly sensitive to ground level ozone and nitrogen.

In Yellowstone, concern about public health and excessive snowmobile pollution were issues raised in over 1,200 snowmobile complaint letters received by the park in 1993 and 1994. As a result, Yellowstone began to study snowmobile emissions and soon found that CO and PM concentrations were high enough to cause health and air quality concerns in West Yellowstone, along the snowmobile trail to Old Faithful, and in the parking lot at Old Faithful (NPS Air Quality Division 1995). In addition to adverse pollution impacts on

visitors, Yellowstone has been forced to enclose ranger booths at its West Entrance to protect rangers from dizziness, nausea, fatigue, headaches, and breathing problems. Fresh air is pumped into entrance kiosks where rangers have reported difficulty counting change. Park visitors have reported tasting the visible haze which surrounds busy entrances and trailheads.

Carbon monoxide is particularly dangerous because it binds to the hemoglobin in blood (forming carboxyhemoglobin) and renders hemoglobin incapable of transporting oxygen (Snook-Fussell 1997). Elevated levels of carboxyhemoglobin can cause neural-behavioral effects at lower levels (2-3 percent), headaches and fatigue (10 percent), and respiratory failure and death at higher levels. And the general consensus among medical professionals is that the health risk from CO increases at high altitude -- a risk exacerbated by richer fuel mixtures common at higher elevations. CO is particularly hazardous during pregnancy, and to the elderly, children, and individuals with asthma, anemia or other cardiovascular disease (EPA 1991: 1994).<sup>2</sup> The National Ambient Air Quality Standards for CO of 35 ppm for 1 hour and 9 ppm for 8 hours were established to keep blood levels of carboxyhemoglobin below 3 percent. Notably, some scientists have criticized these standards because of evidence of adverse health effects even at these levels (Watson 1995, Greek and Dorweiler 1990).

Snowmobilers, rangers and other park visitors are exposed to dangerous levels of CO. In Grand Teton National Park, Fussell-Snook (1997) measured the amount of CO emitted from a snowmobile on a Park trail under steady-state conditions.<sup>3</sup> An average of 9.9 g/mile (99 g/hr) to 19.9 g/mile (795 g/hr) of CO was emitted by one snowmobile traveling from 10 to 40 mph. By comparison, an automobile emits 0.01 to 0.04 g/mile of CO under steady-state conditions, or approximately 1,000 times less than a snowmobile. The average CO measurements for a single snowmobile, recorded at different speeds and distances (25-125 feet), ranged from 0.5 - 23.1 ppm. The Montana state one-hour human exposure limit for carbon monoxide is 23 ppm.

It is important to reemphasize that these measurements were based on a single snowmobile only, during steady-state conditions. Unfortunately, snowmobiles travel in packs for sustained periods of time, and often accelerate over hills and banks. It is therefore clear that typical human exposure to CO is of a much greater magnitude, and represents a very significant level of toxic pollution.<sup>4</sup> The results are particularly alarming for rangers and recreationists at trailheads, gas stations, and park entrances, where one hundred snowmobiles can create the equivalent carbon monoxide of more than 100,000 cars.<sup>5</sup>

**2. NPS Duty to Protect Public and Employee Health and Safety**

As a federal employer, the NPS has the responsibility under OSHA and regulation to protect employee health. The Park Service also must perpetuate conditions in the best interest of public health. The permission of snowmobile use in the parks and concomitant impacts to air quality endanger park visitors with respiratory and other ailments and chemical sensitivities. The Park Service must provide a health environment for visitors; current snowmobile use precludes the parks' ability to ensure a clean, healthy environment for visitors and a healthy workplace for employees, as required by law.

There is no scientifically legitimate or legally defensible reason to wait any longer to improve public health and air quality within the Class I airsheds of Yellowstone and Grand Teton national parks.

**3. DSEIS Confirms that 2000 Decision and 2001 Rule Best Protect Visitor and Employee Health and Safety**

NPS concluded that Alternative G in the FEIS was the only alternative that would not impair air quality and visitor and employee health. The DSEIS reaffirms this finding. Under Alternatives 1a and 1b, "Exposure to pollutants and sounds at the West Entrance would be significantly reduced. Additionally, fewer numbers of oversnow vehicles on the roads would help to maintain a smoother road surface and reduce the number of needed ranger patrols. This would minimize injuries to employees caused the jarring of a bumpy road surface. Employees would also not be exposed to unsafe operation of snowmobiles." (DSEIS 168)

The DSEIS is clear that upholding the 2000 Decision "would achieve the greatest improvement relative to the existing condition... With the fewest numbers and types of vehicles operating at speeds and schedules that minimize risk of incident", a snowcoach system is safer than continued snowmobile use. Upholding the snowcoach decision would also "produce the lowest emissions levels." (DSEIS at xi). With rangers wearing respirators, and visitors breathing the same unhealthy air, the DSEIS outlines a clear choice for NPS. In order to comply with law and policy, NPS must select Alternative 1a and immediately correct long-standing risks to public health and safety. Other alternatives fail to meet NPS legal duty to protect visitor and employee health. Alternatives 2 and 3 would increase health risks to the public and employees due to the presence of snowmobile exhaust. "Because snowmobiles would be allowed in the parks [under Alternative 2], effects would increase relative to alternative 1a." (DSEIS p.169). And similarly, "[b]ecause snowmobiles would be allowed in the parks under alternative 3, effects would increase relative to alternative 1a." (DSEIS p.170).

#### 4. DSEIS Fails to Analyze Critical Health Impacts Information

The DSEIS omits several important considerations in its assessment of health effects to employees and visitors. Recent studies and EPA work on fine particulate matter (PM 2.5) demonstrated that fine particulate matter is of great concern. NPS fails to analyze PM 2.5 in the DSEIS. Fine particulate matter—emitted in snowmobile exhaust—is more harmful than larger particulate matter. PM 2.5 is easily inhaled, lodges deeply in the lungs, and accumulates over time in the body. Respiratory ailments, including cancers, have been linked to PM 2.5 exposure. The *Journal of the American Medical Association* recently published a review of these findings. To fully assess risk to public and employee health, NPS must consider health risks from fine particulate matter.

NPS also fails to assess recent advances in understanding about benzene, MTBE and other hazardous air pollutants (HAPs) that are present in snowmobile exhaust. EPA has produced new information and findings on HAPs through mobile source review and this information must be incorporated into NPS' analysis. Appendix A of this document includes a bibliography of recent medical literature on these topics that NPS should evaluate for the FSEIS.

NPS fails to consider the synergistic effects of all of the toxic components of snowmobile exhaust. The EPA (DSEIS comment letter, 4/23/02) raises issues about synergistic effects of carbon monoxide and benzene, particularly at higher altitudes. The other toxic components of snowmobile exhaust also must be analyzed for potential synergistic effects. Employees, in particular those with many seasons of exposure at the West Gate, should be examined for chronic health effects. NPS must also consider vulnerable populations which are more susceptible to air pollutants: pregnant women, young children, the elderly, and those with preexisting health conditions. National parks are supposed to be accessible to all visitors, handicapped and able-bodied. Yellowstone in winter should be accessible to Americans with asthmas, allergies, lung conditions and sensitivities to chemicals. Today, those citizens would be placing their health at risk to enter Yellowstone National Park in winter. NPS must disclose the impacts to vulnerable populations, long-serving employees and general visitors. Yellowstone is currently an unhealthy place to work and visit. NPS must make clear how that situation is to be rectified in a clear, factual manner that provides health practitioners, visitors, and employees the ability to gauge exposure and potential health risk.

A recently released report by Kado (2001) must be immediately incorporated into Park Service analysis based on the severe health impacts disclosed. (Kado, N.Y. Kuzmicky, P.A., and Okamoto, R.A., 2001. *Environmental and Occupational Exposure to Toxic Air Pollutants from Winter Snowmobile Use in Yellowstone National Park*.) This report confirms the serious health risks to park employees and visitors alike caused by snowmobiles. Crucial points from this study which require immediate NPS response to protect visitor and employee health and safety include:

- "For commuters in Los Angeles, the concentration of PM2.5 inside the vehicle ranged from 29 to 107 ug/m<sup>3</sup>, with ambient concentrations of 32 to 64 ug/m<sup>3</sup>... Many Park employees are exposed to concentrations of PM2.5 that exceed these ranges and generally for longer periods of time."

- "The employees who patrol on snowmobiles were exposed to concentrations of PM that were also very close to the concentrations measured for employees at West."
- "National Park workers were exposed to benzene concentrations that are many times higher than benzene concentrations reported for urban workers who worked in traffic (Crebelli et al, 2001)."
- "Benzene concentrations for Park employees ranged from approximately 3 to 44 times the concentrations of occupational exposure for traffic workers in Rome."
- "Benzene concentrations measured at the West location were approximately 10-30 times higher than concentrations measured inside commuter vehicles during a 2-hour commute in Sacramento and 5 to 10 times higher than inside vehicles commuting in Los Angeles."
- "The West and mobile patrol employees are exposed to concentrations of ethyl benzene, m,p-xylene, o-xylene that are approximately 10 times higher than concentrations measured inside of commute vehicles in Sacramento and Los Angeles and more than 10 times higher than ambient 2-hour roadside concentrations in these cities."
- "The National Park workers were also exposed to benzene many times higher than short term 2-hour commuters in Los Angeles (Rodes et al., 1998)."
- "Two of the West Entrance employees exceeded the acute exposure (1-14 days) MRL [minimal risk levels as established by ATSDR] of 62 ug/m<sup>3</sup> for formaldehyde."
- "Efforts to dramatically decrease Park employee exposure to toxic air pollutants should be a high priority and implemented immediately."
- Bioassay Results indicate that "Particulate matter collected from the snowmobile engine was mutagenic for both the mineral-based (Base) and biosynthetic (Bio) lubricants."

#### C. Wildlife

##### 1. Regulatory and Policy Requirements

According to NPS regulations, snowmobiles are prohibited except where designated and "only when their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and *will not disturb wildlife* or damage park resources" (36 CFR 2.18(c)) (emphasis added).

The prohibition against disturbance of wildlife is a "no tolerance" restriction. Any disturbance of wildlife violates the regulation and must be eliminated by NPS. Disturbance is defined in the DSEIS as "to interfere with, or destroy the tranquility or composure of wildlife." (DSEIS, p.116).

NPS Management Policies further state that "The National Park Service will maintain as parts of the natural ecosystems of parks all native plants and animals...The Service will achieve this maintenance by...[m]inimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them." (NPS Policies at 4.4.1).

##### 2. Snowmobile Impacts to Wildlife

Winter in Yellowstone and Grand Teton is a critical time for wildlife when any added stress can mean the difference between survival and death. The literature describes "several important factors: the extreme challenges wildlife species face in severe winter environments; the high importance of winter ranges as refugia; and describes the effects that human activities cause when superimposed on these ranges (see FEIS, pages 237-241)." (DSEIS, p. 117). Furthermore, "Ungulates function at an energy deficit during winter because snow reduces forage availability, affects an animal's ability to escape predators, and increases energy costs at a period of time when the nutritional value of winter forage is low." (DSEIS p. 123).



Numerous studies since the 1970s have reported that "thermal areas with snow-free vegetation or shallow snow are also very important winter habitats for elk along the Madison, Firehole, and Gibbon Rivers." Yellowstone's main oversnow access roads are built in these river valleys, setting up conflict between winter visitors and wildlife. This conflict, primarily between snowmobiles and wildlife, contravenes law, regulation and policy.

Eighteen Ph.D. scientists, including many of North America's foremost experts in wildlife biology and ecology, recently concluded that the Park Service relied upon sound science in its decision to phase out snowmobile use from Yellowstone and Grand Teton national parks. In October, 2001, the scientists sent a letter to Secretary of Interior Gale Norton cautioning her that: "ignoring this information would not be consistent with the original vision intended to keep our national parks unimpaired for future generations."

*Based on the scientific evidence, it is our professional opinion that snowmobiling results in significant direct, indirect, and cumulative impacts on wildlife, their behavior and environment. As documented in the scientific literature and the Park Service's EIS and ROD, impacts to wildlife include harassment, displacement from important or critical habitats, disruption of feeding activities, alteration in habitat use and distribution patterns, and depletion of critical energy supplies in individual animals potentially resulting in increased mortality or reduced productivity. Such impacts are magnified in the severe winter climate of the Greater Yellowstone Ecosystem where energy is a critical factor in determining survival.*

*Given the nature preservation mandate of the NPS, the harassment, degradation, and disruption of park wildlife attributable to snowmobiling clearly violate the NPS impairment standard. Ignoring this information would not be consistent with the original vision intended to keep our national parks unimpaired for future generations. (Letter to Secretary Gale Norton, October, 2001).*

### 3. 2000 Decision and 2001 Final Rule Findings of Impairment to Wildlife

In the 2000 Decision and 2001 Final Rule, NPS found that snowmobile use impairs wildlife in the parks and violate guiding laws, regulations and policy. All of the snowmobile alternatives analyzed in the FEIS are found to be "inconsistent with the health and integrity of resources in the three park units. Continued use [of snowmobiles] hinders the enjoyment of resources and values for which the parks were created, most notably natural soundscapes, clean and clear air, and *undisturbed wildlife in a natural setting*," (emphasis added)(Record of Decision). As discussed earlier, included in this impairment finding was Alternative F, which analyzed the use of guided snowmobile tours similar to Alternative 3 in Draft Supplemental EIS.

### 4. DSEIS Reconfirms Findings of 2000 Decision and 2001 Rule

The DSEIS "maintains, as concluded in the FEIS and ROD, that there are indeed effects to wildlife from oversnow motorized use, and that these effects are adverse. The parks were established, in part, to provide areas of security for wildlife." (DSEIS p.216).

"Rangers were asked to provide narrative accounts on their experiences dealing with oversnow motorized use and wildlife in YNP. Of the nine rangers who provided written accounts, all emphasized the frequent, often daily, occurrence of conflicts among ungulates (primarily bison) and oversnow motorized use, particularly snowmobiles." (DSEIS p. 117) Table 76 on page 211 of the DSEIS shows "relative risks associated with each road segment as based on a YNP employee survey related to wildlife and oversnow motorized use conflicts." The potential for conflict was rated high, medium or low; high indicates "daily occurrences of conflicts between wildlife and oversnow motorized traffic", medium indicates weekly conflicts, and low indicates monthly conflicts." Alternatives 1a and 1b will yield low risk for wildlife-traffic conflicts for all road segments. Alternative 2 would create more conflict as compared to the current situation, yielding a high or medium risk on every road segment. Alternative 3 would spread conflict to currently low-use road segments, yielding the same level of conflict as the current situation.

The risk to wildlife increases based on the sheer number of vehicles operating on road segments: "it may be

concluded that the greater the number of oversnow vehicles in wildlife winter range, the higher the risk of harassment and displacement." (DSEIS p.209) Since DSEIS Alternative 1a removes all snowmobile use and would require a snowcoach fleet of 150 vehicles, overall motorized use of park roadways is significantly reduced. Snowcoaches hold 10-15 people and snowmobiles carry at most two. Alternative 1a would reduce the total number of oversnow vehicles at risk of disturbing park wildlife by up to 90%.

Under Alternatives 1a and 1b, "the overall number of oversnow vehicles in YNP would be greatly reduced. ...for road segments that currently have a high risk for wildlife-oversnow motorized use conflicts, risks greatly decrease due to the elimination of snowmobiles specifically, and the overall reduction in traffic volumes generally." (DSEIS p.210), (DSEIS p.213). Further improving matters for wildlife and compliance with regulation, "NPS policy would require that snowcoach drivers be trained to recognize potential wildlife conflicts and instructed to stop only in areas where wildlife would be unaffected." (DSEIS p.213).

Alternatives 1a and 1b are without doubt the most protective of wildlife. "The potential for adverse impacts to elk and bison from oversnow motorized use under alternative 1a range from none to minor, and all would be considered short term. Specifically, there would be an expected reduction or elimination of road killed large mammals due to the elimination of snowmobiles in the parks. In addition, the replacement of individual snowmobiles with multi-passenger snowcoaches would serve to decrease potential risks associated with disturbance along particular road segments by greatly reducing traffic volume." (DSEIS p.214).

Alternatives 2 and 3 would have greater impacts to wildlife than Alternative 1, and, in so doing, violate NPS legal, regulatory and policy requirements to protect wildlife. Under Alternative 2 "overall associated effects would increase relative to alternative 1a," simply by virtue of leaving snowmobiles in the park, regardless of technology and number. (DSEIS p.215). "Specifically, road kill mortality caused by oversnow vehicles would be greater (the occurrence is historically limited to snowmobiles only), risks associated with harassment and displacement would increase, and physiological stress responses would rise due to higher traffic volumes." (DSEIS p.216-7).

With Alternative 3, "[o]verall, effects increase relative to alternative 1a because snowmobile are allowed in the parks on all major existing motorized routes except the Teton Park Road and Jackson Lake." (DSEIS p.219). Under Alternative 3, the impacts of snowmobile use are again spread more widely throughout the park; reductions in risk along some road segments "may be made up for on other segments where the number of expected vehicles would rise due to redistributed use throughout the park." (DSEIS p.218).

### D. Natural Soundscapes

#### 1. NPS Law and Policy Requires Highest Protection of Natural Soundscapes

NPS policies direct the Service to "preserve, to the greatest extent possible, the natural soundscapes of parks." The policies define natural soundscapes as that those which "exist in the absence of human-caused sound." Natural soundscapes are comprised of animal sounds and sounds of the physical environment. In Yellowstone, the hiss and splash of a geyser, the bubbling of a mudpot, and the grunt of a bison are an irreplaceable part of the park experience. Sadly, today the natural sounds of Yellowstone are too often drowned out by the roar and whine of snowmobiles.

NPS Management Policies of 2001 direct that "The Service will restore degraded soundscapes to the natural condition wherever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound). This will be accomplished through NPS taking "action to prevent or minimize all noise that, through frequency, magnitude or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor use at the sites being monitored." (NPS Management Policies at 4.9) Park Service policy clearly directs parks "to facilitate, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate noise sources. Every visitor who so desires should have the opportunity enjoy natural soundscapes and to hear the sounds of nature without impairment." (DSEIS p.127).

## 2. Snowmobile Impacts to Natural Soundscapes

The opportunity to experience natural sounds and silence is rare in our modernized world; one of the last refuges to experience natural sounds is in our national parks. Park policy notes that "[n]atural sounds and tranquility are major resources of many national parks and are valued by visitors." (NPS Management Policies at 4.9). Current use of snowmobiles in the parks undermines the opportunity to have natural quiet as a part of the national park experience. Snowmobiles emit extreme levels of noise at higher frequencies than automobiles. This combination makes snowmobile noise quantitatively and qualitatively different from other vehicle use in the parks. The Park Service must do everything it can to reduce noise levels in parks to prevent the intrusion of urban noises into park lands.

Snowmobile use in Yellowstone National Park undermines visitors' opportunities to hear natural sounds and quiet as part of their park experience. Snowmobiles emit significant amounts of noise at higher frequencies than automobiles. This combination of volume and pitch makes snowmobile noise quantitatively and qualitatively different from other vehicle use in Yellowstone National Park.

The Greater Yellowstone Coalition and the National Parks Conservation Association conducted a percent-time audible study of snowmobile noise in Yellowstone National Park this winter. Percent-time audible data was collected at 13 sites in the Lower, Midway and Upper Geyser Basins of Yellowstone National Park between Madison Junction and Old Faithful. Eleven of the sites had snowmobile noise present more than 70% of the time, and eight of those were impacted by snowmobile noise 90% or more of the time.

Results of Greater Yellowstone Coalition Percent-Time Audible Study, Yellowstone National Park, February 19-20, 2000.

Site	Percent of Time with Audible Snowmobile Noise
Old Faithful	100%
Mystic Falls Trail	98
Grand Prismatic Spring	98
Solitary Geyser	97
Morning Glory Pool	97
Nez Perce Creek	92
Fairy Falls	90
Great Fountain Geyser	90
Boulder Hot Springs	88
Beehive Geyser	76
Fern Cascades	72
Goose Lake	41
Lone Star Geyser	0

## 3. 2000 Decision and 2001 Rule Findings: Natural Soundscapes Impaired by All Snowmobile Alternatives

All of the snowmobile alternatives analyzed in the FEIS are found to be "inconsistent with the health and integrity of resources in the three park units. Continued use [of snowmobiles] hinders the enjoyment of resources and values for which the parks were created, most notably natural soundscapes, clean and clear air, and undisturbed wildlife in a natural setting." (emphasis added)(Record of Decision).

In the FEIS, the Park Service analyzed several alternatives which included noise limits for new technology snowmobiles. Two of these alternatives, B and D, set lowered noise emissions levels at 70dB and 60dB, respectively. Neither of these alternatives nor any of the other alternatives continuing snowmobile use, was

deemed adequate to protect park resources.

## 4. DSEIS Confirms 2000 Decision Finding that Snowcoaches Provide Best Protection of Natural Soundscapes

The DSEIS demonstrates that a transition to snowcoach access will dramatically reduce the number of places in Yellowstone and Grand Teton where visitors will hear engine noise more than 50 percent of the time. It shows that if snowmobile use is not phased out, the amount of park land dominated by the roar and whine of machines will be ten to 20 times greater than visitors would experience with snowcoach access. (DSEIS p. 220).

"For Alternatives 1a and 1b, of particular note is the limited acreage in the parks where snowmachines would be heard 50% of the time or more." (DSEIS p.233 Table 84-86). Also, "Alternatives 1a and 1b have the least impact on areas in which no noise is expected, thereby affecting the natural soundscape the least by a substantial margin." (DSEIS p.251).

In Alternative 2 "the number of acres affected where vehicles would be heard 10% of the time or 50% of the time or more is much greater than for alternative 1b. This result is due to the significantly greater number of vehicles present in alternative 2." (DSEIS p.236). For areas where sound would be audible 50% of the time or more, "alternative 2 has by far the greatest number of acres affected." (DSEIS p.237).

In Alternative 3 "The number of acres affected where vehicles would be heard 10% of the time or 50% of the time or more is much greater than for alternatives 1a or 1b. This result is due to the significantly greater number of vehicles present." (DSEIS p.240).

## E. Visitor Experience

### 1. Regulatory and Policy Requirements

NPS Management Policies clarify the affirmative duty of the Park Service to protect resources and ensure the highest quality experience for park visitors. (NPS Management Policies at 8.2) The policies state that the Park Service will provide appropriate, high quality opportunities for visitors to enjoy parks. The policies also make clear that many forms of recreation enjoyed by the public do not require a national park setting and, in fact, can be accomplished more appropriately elsewhere.

As a result, the policies require the Park Service:

*To provide for enjoyment of the parks, the National Park Service will encourage visitor activities that:*

- *Are appropriate to the purposes for which the park was established;*
- *Are inspirational, educational, or healthful and otherwise appropriate to the park environment;*
- *Will foster an understanding of, and appreciation for, park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and*
- *Can be sustained without causing unacceptable impacts to park resources or values.* (NPS Management Policies at 8.2).

"Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks. ...However, many forms of recreation enjoyed by the public do not require a national park setting and are more appropriate to other venues. The Service will therefore:

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks.

If some types of recreation are not suited for a national park setting, parks can "[d]efer to local, state, and other federal agencies; private industry; and non-governmental organizations to meet the broader spectrum

of recreational needs and demands.” (NPS Management Policies at 8.2). This policy guidance is particularly appropriate in this instance, as over 400 miles of snowmobile trail exists in the West Yellowstone area alone, and hundreds of more miles of trail are available on Forest Service lands bordering the parks.

“Unless mandated by statute, the Service will not allow visitors to conduct activities that:

- ♦ Would impair park resources or values;
- ♦ Create an unsafe or unhealthful environment for other visitors or employees;
- ♦ Are contrary to the purposes for which the park was established, or
- ♦ Unreasonably interfere with: the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic or commemorative locations within the park;...”

(NPS Management Policies of 2001, at 8.2).

For the visitor able to come to Yellowstone in winter only once in a lifetime, the ability to breathe pure air, hear natural sounds and view wildlife in its natural state is of the utmost importance. “Winter visitor surveys indicate that the most important factors for visitor enjoyment in the parks are opportunities to view scenery and wildlife, the safe behavior of others, and opportunities to experience clean air and solitude.” (Final Rule). The Park Service found that snowmobiles adversely impact all of these components of visitor experience, detracting from the intent of Park Service mission and policies.

Results of surveys show that the two primary reasons for winter visitation are to view scenery and view wildlife. The top four reasons given for snowmobiling in Montana were to “observe scenic beauty, take in natural surroundings, enjoy smells and sounds of nature, and understand the natural world better.” (DSEIS p.137). And “A recent study indicates that respondents ranked experiencing tranquility, peace, quiet, and getting away from crowds as highly important.” (DSEIS p. 257).

### 2. 2000 Decision and 2001 Rule Findings Show Only Alternative G Ensures Compliance with NPS Legal Duties for Visitor Experience

Continued snowmobile use in the parks was found to impair visitor experience. All of the snowmobile alternatives analyzed in the FEIS are found to be “inconsistent with the health and integrity of resources in the three park units. Continued use [of snowmobiles] *hinders the enjoyment of resources and values for which the parks were created*, most notably natural soundscapes, clean and clear air, and undisturbed wildlife in a natural setting.” (emphasis added)(Record of Decision).

The Park Service found the impact of snowmobile use in the parks on visitor experience particularly egregious:

*Further, it adversely impacts the enjoyment of those values and resources by other visitors. The impact on people who may visit the three parks once or twice in a lifetime, and who seek the resources and values for which the parks were created, may be adversely and irretrievably affected.* (NPS Record of Decision, November 2000).

### 3. DSEIS Reconfirms that Alternative 1a Ensures Compliance with NPS Duty to Provide High Quality Visitor Experience

The DSEIS shows that “impacts on the natural soundscape, the viewing of wildlife, clean air, and other experiential factors” are remedied to the greatest extent by a snowcoach decision. These improvements will have dramatic, immediate benefits to visitor experience. Upholding the original decision would also “represent an incentive to visit for other potential visitors who have been displaced in the past or who do not visit because of the existing condition.” (DSEIS at xiii). The only drawback of the snowcoach system for visitors disclosed in the DSEIS is to those visitors whose enjoyment of the park “is based fundamentally on access by snowmobile”. The presence or absence of the other factors listed above that are valued highly by the majority of park visitors would appear to be of little consequence to those visitors seeking a particular mode of access rather than a high quality park experience.

Alternative 1a and 1b would allow “only snowcoaches that can meet strict sound standards would be

allowed in the parks”. As older snowcoaches were “retrofitted or phased out the opportunities to experience quiet would be greatly improves. Average noise levels would not exceed 50 dB at 100’ on any road segment.” (DSEIS p.257). As a result, “[t]he reduction in emissions and sound under this alternative would result in direct major beneficial improvement to the experiences of park visitors.” (DSEIS p.258).

### XIII. DSEIS Reconfirms 2000 Decision and 2001 Rule Findings of Potential Economic Opportunities Through Implementation of Snowcoach System

While NPS is not directed to base any decision-making on economic outcomes, it is commendable that NPS has committed time and effort to analyzing specific concerns of gateway communities. These concerns, voiced mainly by the cooperating states and counties, are skewed to a minority opinion: that disaster will befall Yellowstone’s gateway communities should a snowmobile phaseout occur. The DSEIS begins the work of disclosing that this view is, fortunately, mistaken and that, in fact, there are numerous economic benefits to be derived from a snowmobile phaseout.

The DSEIS, however, fails to adequately analyze potential socioeconomic benefits or mitigation measures. The DSEIS recognizes that, “[a]s noted by some local businesses in comments in the DEIS, a change in policy may lead to economic diversification and help some firms that lost business from a variety of users as snowmobiles became the dominant use.” (DSEIS pp. 154-155) Later, the DSEIS states that “[i]s however, the nature of business to start or changes course based on economic self-interest and survival. Long term economic impacts are not easy to determine because of this dynamic, and because the business world is adaptable and creative. So, as indicated in the analysis, it is possible that the negative regional impacts of some alternatives could be offset by a change in the type and mix of visitors coming to the parks.” (DSEIS p.286).

NPS must fully and specifically analyze the economic opportunities of full protection of the parks through a snowmobile phaseout. NPS should include the many examples from other parks that have shifted to mass transit systems: how did Acadia and Bar Harbor, Zion and Springdale, and Denali make the systems work for both town and park? What educational and marketing projects were undertaken to inform the public about why transit changes were made and how those changes *improved* the national park experience? The seeds for much of this work and the energy and commitment to carry it out already exist.

For example, the residents of West Yellowstone, Montana, the most invested snowmobile economy in the region, are not uniformly in favor of continued snowmobiling in the parks. Over 150 business owners, elected officials, and residents – nearly a third of the town’s voting population – signed a petition asking the Park Service and Congress to protect Yellowstone National Park.

Over the past eighteen months two town councilmen have asked Congress for the opportunity to convey that many of their constituents believe vigorous protection of Yellowstone is essential to their town’s future economic health.

Visitor spending in West Yellowstone during the winter season have increased each year since 1993 while the numbers of visitors to Yellowstone National Park through the west entrance have declined slightly during the same period. According to the Final FIS, the average West Yellowstone visitor eager to snowmobile spends just one day in the park and far more time on the hundreds of miles of snowmobile trails outside Yellowstone. (FEIS p. 402).

One only has to examine the past to examples of dynamic response from the gateway economies. Past changes within Yellowstone National Park have affected the economy of West Yellowstone to different degrees and present good models for success with the current situation.

- **Fires of 1988:** Many predicted disastrous economic consequences for gateway communities following the wildfires of 1988 and park visitation declined approximately 15 percent that year. By 1989, thanks to a creative, collaborative and well-funded advertising campaign, visitation had recovered to pre-fire levels and expenditures increased 6.3 percent. By 1990, expenditures had increased 13.1 percent over previous years (city of West Yellowstone, resort tax payments). A

local paper reported, "Nearly all agree...that the summer of 1990 was about the busiest ever for Wyoming's tourism industry...especially in the northwest (Yellowstone and Grand Teton National Parks) numbers were way up for almost every segment of the tourism sector." (Billings Gazette, 10-21-90)

- **Snowmachine World Expo:** Each year West Yellowstone hosts the Snowmachine World Expo late in the winter season. Three years ago Park managers announced the need for an early end to the winter season, meaning that Expo visitors could no longer access the Park. A number of local businesses expressed concern that the early closure would reduce attendance at the Expo, and hurt the local economy. In fact, attendance at the Expo has increased each year since. Closing the Park's winter season appeared to have no impact on the number of visitors or on local businesses.
- **Early End to Park Snowmobiling in 2001:** At the end of the 2000-01 winter season, an early thaw forced the Park Service to close the park to snowmobile use. Visitors were still able to ride into the park on busses and transfer to snowcoaches. Park managers reported that the demand for bus seats exceeded the supply. Rather than canceling their vacation plans, Park visitors overwhelmed the available bus service in order to see Yellowstone. And the early closure of the Park to snowmobiles did not harm the local economy. In fact, visitor spending in West Yellowstone during March 2001 increased 63% over spending in March 2000. This point is shown in graph B (attached)

Public support in the gateway towns for protecting the parks is wide and deeply held. Over 150 West Yellowstone business people, elected officials and residents—nearly a third of the town's voting population signed the petition "A Call for a Healthy Economy and a Healthy Park" asking the Park Service and Congress to:

- Protect Yellowstone and thereby ensure that visitors continue to visit West Yellowstone and support the local economy;
- Support the community of West Yellowstone as it adjusts, diversifies and rises to meet the challenges created by changes in park management.

Gibson Bailey, member of the West Yellowstone Town Council, wrote:

*"We have a great opportunity to create a new economic future for West Yellowstone that is balanced. Yellowstone National Park is the ultimate tourist draw. We will never suffer for lack of visitors. We will suffer, however, if we fail to move forward in creating a future with a balanced, diversified economy that makes protection of Yellowstone National Park a priority."*

Jackie Matthews, business owner in West Yellowstone and president of West Yellowstone Citizens for a Healthy Park, stated that: "...phasing out snowmobiles from Yellowstone National Park will not only be good for the park's environment but will also be good business for West Yellowstone."

For two years, she and others have asked the Small Business Committee to help the town transition to snowcoach access into the Park. Specifically, they requested the following help:

- Funding for media and public education campaign to promote winter snowcoach tourism in Yellowstone, similar to the successful campaign following the fires of 1988;
- Low-interest loans for snowcoach acquisition and other business infrastructure;
- Cooperation among economic development agencies to promote transition to a sustainable future; and
- Job training and business development programs.

Everyone, aside from a small, vocal, industry-supported minority, agrees that the West Yellowstone economy has the opportunity to not only survive, but to flourish without snowmobiles in the parks. Protection of Yellowstone National Park, the chief economic asset of local communities, will do the most to ensure continued economic success for West Yellowstone and other gateway towns. NPS has an obligation to fully analyze the economic opportunities a phaseout would present. NPS has failed to fully

analyze this type of information and instead has allowed a "doom and gloom" approach to prevail. The information recounted above and EPA's astute comments on socioeconomic should be included in the FSEIS to allow for accurate public assessment and government decisionmaking. Also, see The Wilderness Society's comments "Potential economics impacts of a change in motorized access to Yellowstone and Grand Teton national parks and the John D. Rockefeller, Jr., parkway" for more economic information that should be included in the FSEIS.

#### XIV. NPS Must Move Forward With Immediate Implementation of the 2000 Decision and 2001 Rule and Transition to a Snowmobile Phaseout

The original three year process and now the DSEIS have clearly shown that the problems facing national parks cannot be solved by improved snowmobile technology. In Yellowstone and Grand Teton National Parks, this range of issues extends far beyond air quality and soundscapes to wildlife, visitor enjoyment, employee and visitor health and safety, road conditions and park values.

The DSEIS will cause a nearly two year delay in protecting Yellowstone while costing taxpayers \$2.4 million. A failure by NPS to follow through on the DSEIS determination and uphold the rule to protect Yellowstone from snowmobile damage would be based solely on a desire to satisfy the snowmobile industry. Such a decision to allow continued degradation of Yellowstone and Grand Teton National Parks would be at odds with national park law, regulation and policy, a large body of science, and an extensive public process.

In the meantime, an eminently feasible snowcoach plan sits on the books with an implementation plan thoughtfully laid out by the Park Service two years ago. The Park Service and the Department of Interior have the opportunity to move forward with plans to create a successful winter snowcoach transit system in Yellowstone by working with local communities to transition economies and purchase additional vehicles.

Sadly, little energy or resources have been expended to implement the existing decision, which is still legally in force. That decision will hold if snowmobile use is found again to adversely impact resources. The DSEIS findings confirm the 2000 Decision and 2001 Final Rule. Any additional delay in moving forward with implementation measures will result in further delay for protection of the parks and further impairment and impacts, in violation of law, regulation and policy.

#### XV. A Common Sense and Ready Solution: Snowcoaches

The final rule laid out a three-year phase out of snowmobiles from Yellowstone and Grand Teton National Parks (and the John D. Rockefeller Jr. Memorial Parkway). The plan, "overall, will shift oversnow motorized use of the parks from snowmobile use to snowcoach use, to allow continued winter use of the parks while eliminating the impacts on park resources and values from snowmobile use." (Final Rule).

A system of snowcoaches will provide access to the same, if not greater, number of winter visitors. In no way is public access being eroded, rather a recreational pursuit is being eliminated due to its high impacts. A less damaging mode of transportation will be substituted to allow visitor access to the parks.

*Snowcoaches have lower impacts on park resources and values than snowmobiles... snowcoaches, operated by professional, trained drivers operating under NPS concession contracts or permits, are much less likely to be operated in a way that disturbs wildlife than snowmobiles. As a result, expanding the use of snowcoaches... will make it possible to accommodate large numbers of winter visitors to the parks, while still preserving an enjoyable experience for most visitors and avoiding substantial adverse impacts on park resources.* (Final Rule).

Snowcoach transportation—which minimizes noise, air pollution, and trip frequency while maximizing educational opportunities—makes the most sense for Yellowstone in winter. These vehicles hold 10-15 people and provide opportunities for on-board education by drivers, as well as sharing among families, friends and fellow visitors. Snowcoach routes and timing can be synchronized like municipal transit systems to allow individual trip planning and quiet periods for exploring between stops.

Establishment of a snowcoach system in Yellowstone and Grand Teton will reduce overall vehicles in the

parks up to 90%, result in fewer vehicle miles traveled and consequently minimize impacts on wildlife. Snowcoach access also will provide better opportunities for certain segments of society that currently visit the park in winter in very low numbers, such as women, children and senior citizens.

**XVI. Park Service Provides Good Models for Snowcoach Transition in 2000 Decision and 2001 Rule** Seventy-four national parks have successfully implemented some form of mass-transit program. According to NPS staff in Denali, Zion and Acadia National Parks, one impact of these programs is that visitors spend more time shopping and dining in gateway communities than they did in the past as they wait for scheduled bus service.

The NPS should be a leader in promoting clean, quiet and affordable modes of group transportation which are protective of the natural qualities of the parks. Yellowstone in winter is a natural place to look next for expansion of the alternative transportation program already taking place in the Park Service.

The Park Service outlined the components of a successful snowcoach system in the Record of Decision and Final Rule. In the original, November 2000 decision, the Park Service outlined an implementation plan to ensure that the parks would be best protected and that economic interests and local communities would be successful partners with NPS under new winter management. The DSEIS did not place on hold the Record of Decision or Rule which outlined a transition from snowmobiles to a snowcoach transportation system. Furthermore, everyone agrees that, regardless of outcome, snowcoach travel will increase. Therefore, the Park Service should be moving forward with implementation of steps necessary to protect the parks and the local communities. Some transition measures outlined in the Record of Decision (November, 2000) include:

- Unless otherwise noted, the parks will implement all actions the winter following the Record of Decision (ROD) for the winter use plans and FIS, (p.2)
- NPS will develop a detailed snowcoach implementation plan in coordination with gateway communities, concessioners and winter permittees.
- NPS will coordinate with gateway communities, concessioners and winter permittees and state tourism program resources on a new marketing strategy designed to facilitate winter visitation by snowcoach.
- In the winter of 2000-2003, existing commercial snowcoach operators will be encouraged to increase their fleet size, and snowmobile and other new operators will be encouraged to purchase or lease coaches and reduce snowmobile numbers.

#### XVII. Conclusions: Moving Forward to a Better Future for Yellowstone

As stated in these comments, we do not believe there is any cause or basis for a change in NPS direction from the 2000 Decision and 2001 Rule. The information and analyses contained in the DSEIS emphatically confirm the existing decision and rule. A snowcoach system will best protect the parks' resources and values and assure the highest quality visitor experience as required under guiding law, regulation and policy. We strongly urge NPS to select Alternative 1a and immediately correct the impairments and adverse effects to Yellowstone and Grand Teton's resources and values caused by snowmobile use.

The transition plan outlined in the 2000 Decision and 2001 Rule is a good framework for moving forward. In addition, to ensure a smooth transition to a successful snowcoach system, we recommend that NPS undertake the following:

- **Design, Fund and Implement a Marketing Plan.** Yellowstone is one of the world's best tourist draws. There are myriad opportunities to market a change in winter transportation. For example, NPS could follow the model of public outreach and education that followed the 1988 fires. Marketing experts could be brought to the region to assist local chambers, counties and states with strategy. NPS should fund a marketing effort and cooperate with local and state governments, business owners and chambers of commerce to implement a marketing plan that will ensure continued visitation to the parks at historic levels.
- **Develop, Fund and Implement a Snowcoach Transportation Plan.** NPS has raised many ideas

about the specifics of a snowcoach transit system. A transportation plan which delineates the nuts and bolts of the snowcoach system would benefit business owners, the public, government entities and other stakeholders. The plan should be prepared with input from transportation planners with experience with group transit systems in parks, local experts on winter visitor needs, and current winter operators. The plan should delineate a shuttle system which runs on a regular schedule, allowing local and regional day visitors flexibility at lower cost than chartered tours. Other components could include location of additional warming huts, shuttle stops, and additional interpretive opportunities. Other opportunities to examine include a cooperative snowcoach maintenance facility and NPS acquisition and leasing of vehicles to concessionaires. NPS should investigate opportunities to fund the snowcoach system through mass transit funds, including the ongoing TEA reauthorization.

- **Expand Snowcoach Fleet.** NPS has failed to move forward with expansion of the snowcoach fleet. There are both immediately implementable and longer-range means to provide full visitor access via snowcoach.
  - **Expand Existing Snowcoach System.** Matricks, Inc. is able immediately to produce an enough track systems to be fitted onto vans to raise the fleet to 150, the projection of snowcoaches needed to accommodate current visitation levels. There are estimated to be up to 50 Bombardiers available for sale in the U.S. and Canada. These unique vehicles could be retrofitted relatively inexpensively to meet modern emissions standards, and would fill a special niche in park winter travel.
  - **Explore New Generation Snowcoach.** Farther into the future, the ongoing INEEL project and other endeavors to build a new generation snowcoach may yield enough vehicles for the parks. We encourage NPS support of these efforts to increase the snowcoach fleet to provide winter transportation well into the future.
- **Convene a Community Transition Task Force.** A transition task force of winter operators, NPS officials, and other interested stakeholders could play an important role in a smooth transition. This group would be engaged in the on-the-ground transition process. The task force would ensure open communication between the parties and facilitate quick response time to emerging needs or problems. For example, if shuttle system times weren't adequate for visitor needs or if a new warming hut appeared necessary, the task force could assess the needs and move towards a solution together, quickly.

#### Appendix A. Additional studies of air pollution and human health.

Magari S.R., Schwartz J., Williams P.L., Hauser R., Smith T.J., Christiani D.C. 2002. The association between personal measurements of environmental exposure to particulates and heart rate variability. *Epidemiology* 13(3):305-10.

Moolgavkar S.H. 2000. Air pollution and daily mortality in three U.S. counties. *Environ. Health Perspect.* 108(8):777-84.

Zanobetti A., Schwartz J., Gold D. 2000. Are there sensitive subgroups for the effects of airborne particles. *Environ. Health Perspect.* 108(9):841-5.

Pope C.A. 2000. Epidemiology of fine particulate air pollution and human

health; biologic mechanisms and who's at risk. *Environ Health Perspect.* 108(4):713-23.

Mehlman MA. 2001. Methyl-tertiary-butyl-ether (MTBE) misclassified. *Am. J. Ind. Med.* 39(5):505-8.

Opiekun R.E, Freeman N.C, Kelly-McNeil K, Fiedler N.L, Lioy P.J. 2001. Effect of vehicle use and maintenance patterns of a self-described group of sensitive individuals and nonsensitive individuals to methyl tertiary-butyl ether in gasoline. *J Expo. Anal. Environ. Epidemiol.* 11(2):79-85.

<sup>1</sup> Federal standards for CO are 35 and 9 parts per million for a one and eight hour average, respectively. 40 CFR § 50.8(a)(1)(2). State standards differ for Montana and Wyoming. In Montana, the CO standards are 23 and 9 ppm for the 1 and 8 hour averages, respectively, while Wyoming's standards are identical to those of the federal government.

<sup>2</sup> For a summary of the human health effects of snowmobile pollutants, including carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter, *See* EPA (1994).

<sup>3</sup> Snowmobiles emit more pollutants when accelerating. The steady-state conditions in this study, therefore, represent a "best case" emission volume (Fussell-Snook 1997).

<sup>4</sup> In addition, the impact of CO exposure increases with increasing altitude, especially for unacclimated individuals (National Commission on Air Quality 1980). Thus, because much snowmobile use occurs at higher altitudes, risks to human health are even greater.

<sup>5</sup> Based on the aforementioned correlation between cars and snow mobiles in terms of carbon monoxide emissions.

Greater Yellowstone Coalition  
P.O. Box 1872  
Bozeman, MT 59771

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

Dear Planning Team:

**Please accept these comments on behalf of the Greater Yellowstone Coalition, Natural Resources Defense Council, The Wilderness Society, Natural Trails and Waters Coalition, National Parks Conservation Association, Defenders of Wildlife, Sierra Club, Jackson Hole Conservation Alliance and Wyoming Outdoor Council and our combined memberships throughout the region and country.**

Yellowstone and Grand Teton National Parks are unique, beloved places deserving of the highest protection. The impacts and impairment caused by snowmobiles to these magnificent parks is of great concern to our organizations and the vast public supportive of national park protection that we communicate with. Images of rangers in respirators, wildlife struggling through deep snow to escape harassment by snowmobiles, and constant noise drowning out the natural sounds of famous features like Old Faithful have galvanized overwhelming support for action to correct these problems.

Snowmobile use in the parks impairs air quality and health, natural soundscapes, wildlife and visitor experience. It is clear from the vast body of science and clear direction of the law, regulation and policy governing national parks, that only a snowcoach system will eliminate these impairments of park resources and values. A phaseout of snowmobiles from the parks and transition to a people-friendly, park-friendly snowcoach system is necessary to give Yellowstone and Grand Teton full protection.

As stated in our comments, we do not believe there is any cause or basis for a change in NPS direction from the 2000 Decision and 2001 Rule. The information and analyses contained in the DSEIS emphatically confirm the existing decision and rule. A snowcoach system will best protect the parks' resources and values and assure the highest quality visitor experience as required under guiding law, regulation and policy. We strongly urge NPS to select Alternative 1a and immediately correct the impairments and adverse effects to Yellowstone and Grand Teton's resources and values caused by snowmobile use.

The transition plan outlined in the 2000 Decision and 2001 Rule is a good framework for moving forward. In addition, to ensure a smooth transition to a successful snowcoach system, we recommend that NPS also immediately undertake the following:

- **Design, Fund and Implement a Marketing Plan.** Yellowstone is one of the world's best tourist draws. There are myriad opportunities to market a change in winter transportation. For example, NPS could follow the model of public outreach and education that followed the 1988 fires. Marketing experts could be brought to the region to assist local chambers, counties and states with strategy. NPS should fund a marketing effort and cooperate with local and state governments, business owners and chambers of commerce to implement a marketing plan that will ensure continued visitation to the parks at historic levels.
- **Develop, Fund and Implement a Snowcoach Transportation Plan.** NPS has raised many ideas about the specifics of a snowcoach transit system. A transportation plan which delineates the nuts and bolts of the snowcoach system would benefit business owners, the public, government entities and other stakeholders. The plan should be prepared with input from transportation planners with

experience with group transit systems in parks, local experts on winter visitor needs, and current winter operators. The plan should delineate a shuttle system which runs on a regular schedule, allowing local and regional day visitors flexibility at lower cost than chartered tours. Other components could include location of additional warming huts, shuttle stops, and additional interpretive opportunities. Other opportunities to examine include a cooperative snowcoach maintenance facility and NPS acquisition and leasing of vehicles to concessionaires. NPS should investigate opportunities to fund the snowcoach system through mass transit funds, including the ongoing TEA reauthorization.

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  - **Explore New Generation Snowcoach.** Farther into the future, the ongoing INFEEL project and other endeavors to build a new generation snowcoach may yield enough vehicles for the parks. We encourage NPS support of these efforts to increase the snowcoach fleet to provide winter transportation well into the future.
- **Convenea Community Transition Task Force.** A transition task force of winter operators, NPS officials, and other interested stakeholders could play an important role in a smooth transition. This group would be engaged in the on-the-ground transition process. The task force would ensure open communication between the parties and facilitate quick response time to emerging needs or problems. For example, if shuttle system times weren't adequate for visitor needs or if a new warming hut appeared necessary, the task force could assess the needs and move towards a solution together, quickly.

We appreciate the opportunity to comment and look forward to your response to our concerns. We would be eager and willing to assist NPS in any way to help ensure a smooth transition to a snowcoach system, and a better future for Yellowstone and Grand Teton National Parks.

Sincerely,

Hope Sieck  
Greater Yellowstone Coalition



Izaak Walton League of America, Inc.

DEFENDER OF SOILS, WOODS, WATERS, AIR AND WILDLIFE.  
COLORADO DIVISION

Amy Miller  
Colorado Division IWL  
2150 Chesapeake Drive  
Ft Collins, CO 80524

#### Snowmobile Use in Yellowstone National Park - Resolution # 1

In the year 2000 a proposal was made to phase out snowmobile use in Yellowstone National Park over the next several years. However the Bush administration rescinded this ban. By 2002 several problems have developed in the Park. At the west entrance the employees were outfitted with oxygen masks due to pollution from the 2 cycle engines from as many as 1300 machines at that entrance on a given day. The rangers found an unusually large number of intrusions into the back country which is off limits to the machines, especially in areas hard to police. Also there has been an increase in the incidents of wildlife harassment. In a tour this last February many of the employees expressed strong feelings against the majority of the snowmobilers and felt they were not there to enjoy the wildlife, the scenery, and the winter solitude of the Park, but just to "snowmobile in the park".

The Colorado Division, Izaak Walton League of America, assembled in convention at Denver, Colorado, May 11, 2002, strongly urges the installation of controls on number and only tours of snowmobiles in Yellowstone Park in Winter due to their harassment of wildlife, the pollution by the engines at the entrance gates and rest areas, and the shattering of the winter solitude. Restricting the snowmobiles to less polluting 4 cycle engines, to a maximum of 400 a day and to guided tours only would help this situation.

Amy Miller, Front Range and Colorado All State Chapters

*Received communication by mail May 11, 2002*  
*Amy Miller, for IWL*  
*Colorado Division*  
*3150 Chesapeake Dr.*  
*Ft. Collins, CO 80524*  
*970-221-9669*



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May 27, 2002

Steve Martin and Suzanne Lewis, Superintendents  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

RE: Winter Use Draft SEIS Comments

Dear Superintendents Martin and Lewis,

The Jackson Hole Conservation Alliance (Conservation Alliance) is dedicated to responsible land stewardship in Jackson Hole, Wyoming to ensure that human activities are in harmony with the area's irreplaceable wildlife, scenic and other natural resources. We have over 1800 members in 49 states and six foreign countries. The Conservation Alliance has been involved with the issue of winter use in Yellowstone and Grand Teton National Parks since the original review process began.

The Conservation Alliance views Yellowstone and Grand Teton National Parks as the core of the Greater Yellowstone Ecosystem. These areas are vital to the natural functioning ecosystem that exists in this incredible place and we feel that the national parks are areas where wildlife and the natural systems they rely on should take priority over motorized recreation. In addition, the parks should set examples for other land managers in the region.

The Conservation Alliance supports Alternative 1A in the Winter Use Supplemental Environmental Impact Statement (SEIS). The Park Service has already examined this issue with great scientific scrutiny. This most recent round of evaluation has proven that no new scientific information exists, let alone warrants a change in the original decision to phase snowmobiles out of the parks. We believe credible scientific evaluation, coupled with years of overwhelming public support, more than justifies the original decision of the Park Service.

To this end, our more detailed comments are included with those of the Greater Yellowstone Coalition and other conservation groups.

Thank you for the opportunity to comment.

Sincerely,

Franz Camenzind, Ph.D.  
Executive Director

*The Jackson Hole Conservation Alliance is dedicated to responsible land stewardship in Jackson Hole, Wyoming, to ensure that human activities are in harmony with the area's irreplaceable wildlife, scenic and other natural resources.*

P.O. Box 2728 685 S. Cache St. Jackson, WY 83001 (307) 733-9417 FAX (307) 733-9008 E-mail: jhca@wyoming.com Web: www.jhcaalliance.org



Kettle Range Conservation Group  
PO Box 150  
Republic WA 99166  
509-775-2667

May 29, 2002

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83002

Dear National Park Service,

Thank you for the opportunity to comment on the Winter Use SEIS, which addresses the regulation of snowmobile use on Yellowstone and Grand Teton National Parks.

Kettle Range Conservation Group requests that the NPS uphold the original decision (now represented in alternative 1a), which was based on high-quality science and 22 public comment periods. The original decision and would phase out the use of snowmobiles in these two national treasures. The decision—based on a decade of scientific studies by university researchers and government agencies—found that snowmobiles are damaging the parks' wildlife, clean air, natural sounds and quiet, and significantly interfering with the unique experiences that Americans expect to find in their national parks. The Environmental Protection Agency described the underlying science as "among the most thorough and substantial base that we have seen supporting a (National Environmental Policy Act) document."

The current SEIS process was initiated under intense pressure from the snowmobile industry, which has much to gain from the substantive decision of the original EIS being overturned. Evidencing their lack of scientific basis for the request for additional analysis, the snowmobile industry was unable to offer any new research or data to be analyzed in the SEIS.

Please consider the following in selecting the best alternative:

- ♦ The "cleaner and quieter machine" approach being pushed by the snowmobile industry as the answer to all problems associated with the craft will do nothing to reduce the impact of the more than 1.4 million snowmobiles currently operating on public lands. Furthermore, research has shown that the impacts of snowmobiles on wildlife go far beyond the effects of engine noise. Compaction of snow, invasion of high-quality,

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secluded habitat, and other adverse impacts will continue to occur with "cleaner, quieter" machines.

- ♦ Although the National Park Service at Yellowstone and Grand Teton is obligated to provide appropriate opportunities for outdoor recreation, the Organic Act dictates that such recreation not impair park resources and values. Courts have consistently upheld the position that the Park Service is required to leave the resources and wildlife of the park system "unimpaired" for future generations.
- ♦ Americans want Yellowstone and Grand Teton to remain peaceful places in winter where bison, elk, and other wildlife are not harassed by noisy vehicles. Visitors should not have to struggle through a nearly constant roar of machines to hear Old Faithful. Snowmobile use in the two parks would continue to pollute, make rangers sick and prevent visitors from enjoying the solitude that Americans expect from their national parks.
- ♦ The snowmobile industry has worked hard to discredit a snowcoach solution. However, an additional study, conducted as a result of an industry lawsuit, revealed once again that snowmobiles will produce more pollution, noise, and disruption of Yellowstone's wildlife than snowcoaches.

Clearly, the single management alternatives in the SEIS implementing the original Park Service decision (1A) is the one needed to effectively stop the harassment of wildlife, soundscape invasion, and pollution caused by the tens of thousands of snowmobiles that roar through these parks every year. Under the other three alternatives, wildlife would continue to be harassed, soundscapes would continue to be disrupted, and unhealthy pollution of air and water would continue to increase.

Thank you for the opportunity to comment on the Winter Use SEIS.

Sincerely,

  
David Heffick  
Director, Forests and Rivers Program



May 26, 2002

Yellowstone/Teton National Parks  
P.O. Box 352  
Moose, WY. 83012

Dear Park Administrators:

I am writing to you on behalf of Last Chance Audubon, a local conservation organization of over 300 members, concerning the Draft SEIS for Winter Use in Yellowstone and Teton National Parks. Because of our membership's interest in protecting wildlife habitat and the creatures dependent upon that habitat, we want to voice our support for Alternative 1A. Our position is based upon the law, science, and judgement of park professionals. We believe that the widespread use of individual snowmobiles is having a detrimental impact on the natural resources of the park, as well as on the park visitor experience. As birdwatchers and viewers of wildlife, the operation of thousands of noisy, smokey machines within the boundaries of Yellowstone National Park, has had a negative impact on our winter experiences in the park for years. We would not object to the use of a limited number of park-operated snowcoaches to transport visitors from West Yellowstone to Old Faithful Inn during the winter season.

We do not believe it is appropriate for National Park policy to be dictated by commercial interests, either inside or outside the park. Solitude is an increasingly rare commodity in 21st century America; and if it cannot be found within our national parks we have a serious problem as a culture. We welcome this opportunity to comment on winter park policies.

Sincerely,

  
Brian Shovers, Conservation Chair

# NPC

## Noise Pollution Clearinghouse

P.O. Box 1137, Montpelier VT 05601-1137  
toll free (888) 200-8332 ♦♦♦ (802) 229-1659

### "Good Neighbors Keep Their Noise To Themselves."

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Statement concerning snowmobiles in Yellowstone National Park. The remarks that follow constitute the comment of the Noise Pollution Clearinghouse (NPC) in support of Alternative 1a.

#### • Board •

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Environmental Consultant

**John Moyers**  
Executive Director  
The Florence Fund

**Alice Suter**  
Principal  
Suter and Associates

I am the Executive Director of NPC. I have an educational background in math, physics, and environmental policy, and am a member of the Acoustical Society of America (ASA). I am a member of the ASA's Noise Technical Committee and the American National Standards Institute S12 Noise Committee.

The Draft SEIS correctly recognizes that, "Natural sounds and tranquility are major resources of many national parks and are valued by visitors" (127). Peace and natural quiet are in short supply in our country today, and our parks provide one of the few places where citizens have access to these valuable resources.

The past century has seen unprecedented growth in noise in the United States. 100 years ago, the Ford Motor Company and the airplane did not exist. The two biggest noisemakers fit today were unheard then. The 20<sup>th</sup> Century saw a great increase in noise, which was most often accompanied by the burning of fossil fuels. This increase was driven primarily by the internal combustion (and later turbine) engine(s).

#### • Advisory Board •

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Writer and  
Environmental Activist

**Bill McKibben**  
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Environmental Activist

**Stephanie Mills**  
Writer and  
Environmental Activist

**David Morris**  
Director  
Institute for Local Self-Reliance

Even in the last 30 years the growth of noise sources has been significant. By the year 2000, passenger car traffic (vehicle miles traveled) had increased to 175% of 1970 levels. Small truck use in 2000 was 750% of 1970 levels; large trucks, 261%; and combination tractor-trailers, 385%. Commercial aircraft vehicle miles traveled has also taken off: 273% of 1970 levels. The really big growth, and the one many citizens most complain about, is in nighttime air traffic. Air cargo in the year 2000, which is a large percentage of nighttime flights, had grown to 545% of 1970 levels. (US DOT, Federal Highway Administration, Highway Statistics 2000, Table VM-1, US BTS National Transportation Statistics 1999, Tables 1-9 and 1-28, US DOT, Air Carrier Traffic Statistics Monthly, Dec. 2000.)

Also, since 1970 the invention of new noise sources has been significant. The last 30 years have seen the invention (or vastly increased use) of numerous new noise sources: the leaf blower, weed whacker, boom box, boom car, jake brake, off-road vehicle, jet ski, cell phone, car alarm, even cars that honk when locked, to name a few.

#### • Executive Director •

**Les Blomberg**  
Noise Pollution Clearinghouse

The story of the soundscape during the past 100 years is the story of the invention of new noise sources, the growth in the quantity of those sources, and the spread of those sources into previously quiet areas, including our National Parks. During the 20<sup>th</sup> Century, modern transportation noise went from unheard to ubiquitous. In most communities today, transportation vehicles produce the ambient noise 24-hours-a-day on which the many other noises are overlaid. And unfortunately, the invention of new noise sources

did not end with the car and airplane. Moreover, environmental noise has spread far beyond urban boundaries, to suburban, rural, and even wilderness areas.

Because of the unprecedented growth in noise, our National Parks are some of the few places where citizens have access to the natural quiet that has been lost in our urban, suburban, and rural soundscapes. Fortunately, the Park Service has recognized the importance of natural quiet, and the importance of protecting natural quiet: "The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. Natural soundscapes exist in the absence of human-caused sound... The Service will restore degraded soundscapes to the natural condition wherever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound)" (NPS Management Policies of 2001).

But even in our National Parks, and in Yellowstone in particular, natural quiet is difficult to find. The internal combustion engine, the source of so much noise in our communities, is also degrading Yellowstone. In the 1980s, I took a winter ski trip to Yellowstone, and was forced to listen to the drone of snowmobiles racing through the park, not the natural soundscape. I have not returned. The resource of natural quiet has been severely degraded, more so than in many less pristine areas outside the Park.

The Draft SEIS provides substantial evidence that Alternative 1a is needed to uncover the natural soundscape. As the document notes, "Alternatives 1a and 1b have the least impact on areas in which no noise is expected, thereby affecting the natural soundscape the least by a substantial margin" (251).

The case for Alternative 1a is much stronger than the SEIS states. The analysis of noise neglected, misrepresented, or understated four key factors: the noise footprint of each vehicle type, the number of instances of interference, the effect of the cumulative vehicle miles traveled, and the fair comparison of noise levels between snowmobiles and snowcoaches. In addition, the definitions of impacts to natural soundscapes are flawed. If these five factors had been adequately addressed, the Draft SEIS would have found that Alternative 1a is the only alternative whose soundscape approaches that required within a National Park.

#### Noise Footprint of Each Vehicle at Any Given Time

Table 80 on page 228 provides the distance to the limit of audibility for various vehicles. The data approaches the concept of noise footprint, but it does so in only one dimension—horizontally from the line of travel. The effect of these vehicles, however, is felt in two and sometimes three dimensions. At the very least, Table 80 should be supplemented with the following table giving the square mile footprint of types and groups:

Vehicle Type	Maximum 50 ft Pass-by Level (dBA)	Area of Noise Footprint (sq miles)	
		Open Terrain	Forested Terrain

		Average Bkgnd	Quiet Bckgrnd	Average Bkgnd	Quiet Bkgnd
Automobile	68	0.54	0.61	0.14	0.16
Bus	76	3.43	4.18	0.77	0.92
Bombardier Snowcoach	75	8.26	10.58	1.68	2.02
4-Track Conversion Van "Matrack" Snowcoach	70	0.46	0.55	0.14	0.16
Snowmobile -- Quiet Available	72.8	1.37	1.56	0.37	0.46
Group of 2 QA Snowmobiles	72.8 each	2.44	2.78	0.62	0.78
Group of 4 QA Snowmobiles	72.8 each	4.43	5.09	1.03	1.33
Group of 8 QA Snowmobiles	72.8 each	8.28	9.56	1.79	2.32
Group of 12 QA Snowmobiles	72.8 each	12.09	14.01	2.50	3.27

The data in the above table should have been used to compare various options. The major difference between this table and Table 80 is that the area impacted is governed by the formula:  $\pi \times \text{radius squared}$ . The absence of the squared factor in Table 80 significantly understates the footprint and impact of each vehicle.

This footprint should have played a large roll in comparing the impacts of alternatives as it more accurately reflects the impact of the vehicles at any given time. Clearly, the noise is not heard just to the side. Table 80 provides the mistaken impression that a single snowmobile has 70% greater impact on audibility than the Matrack snowcoach, when in fact, the impacted area is 3-4 times as great.

#### Instances of Interference and Vehicle Miles Traveled (VMT)

The number of instances of interference with natural quiet is a very important descriptor of noise that was ignored by the SEIS. The use of audible 10% and 50% of the time provides some indication of the duration of interference at limited locations, but hides the instances. The number of vehicle trips or total vehicle miles traveled of each vehicle type is essential to evaluating the instances of interference. This data should have played a key role in analyzing the impacts of the various modes of transportation.

One interesting use of the revised Table 80 above would be to multiply the area of impact by VMT data for various equipment. The result would prove valuable in comparing the impact of vehicle types. Since the vehicles are traveling forward in both time and distance (space), the linear miles traveled can act as a surrogate for time (assuming that

all vehicles travel at about the same speed). Under such a scenario, the impact of snowcoaches is significantly less than currently stated.

Some might criticize the above approach and use the approach of the SEIS and multiply the linear miles by the horizontal distance to get the acres or square miles effected. The limitation of this approach is that it does not indicate the instances of interference or duration of interference. The 10% time audible standard provides some data with respect to this, but the linear miles times area impacted provides a better relative comparison of noise impacts on the soundscape, even if the units (miles cubed) do not seem to make sense.

#### A Fair Comparison of Noise Levels between Snowmobiles and Snowcoaches

Just as the vehicle miles traveled should have been prominently featured in the analysis, so too should the fact that a snowcoach can displace many snowmobiles. This is noted in the SEIS: "For perspective in a summary comparison of alternatives, the following information should be considered. A single snowmobile of a type evaluated in this SEIS (i.e., the quietest available, traveling at normal speed, is audible to a distance of 3,720 feet in open terrain with a quiet natural background. This is about one-third greater than the audibility distance affected by a single gas-powered "Matrack" van snowcoach, which is audible to 2,200 feet under the same conditions. Because a snowcoach of this type would carry 4 to six times more visitors, visitation levels overall can be directly enhanced by a factor of 4 to 6 while reducing audibility distances by a third if snowmobile were replaced by gasoline Mattracks one-for-one. In forested terrain, with a quiet background, the reduction is closer to one half than one third (2,030 to 1,210) feet. Presented another way, in a quiet background, a group of 8 to 12 snowmobiles is audible from 9, 210 to 11,150 feet in open terrain, compared to a gas Matrack carrying the equivalent number of people being audible to 2,200 feet. This replacement would reduce the audibility distance by a factor of 4 to 5 times" (249).

Clearly, this statement would be much stronger if the **area** of audibility was used as described above instead of the **distance** to the side that it can be heard. Moreover, this analysis is so important to comparing alternatives that it deserves an entire subsection of the noise assessment.

In addition, Table 78 should be supplemented with data comparing groups of snowmobiles with snowcoaches as Table 80 does. For example, if each snowcoach offset an 8 snowmobile group, the table would look as follows:

Vehicle	Speed, mph	Sound Level @ 50 ft
8 Snowmobiles	40	81.8
8 Snowmobiles	35	80.5
4-Track (gas) Conversion Van	30	70
Bombardier Snowcoach	30	75

Since a 10 decibel increase is a doubling of the loudness, it is clear that the Bombardier Snowcoach is significantly quieter than the snowmobiles, while the Conversion Van is only half as loud as the snowmobiles.

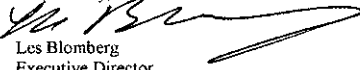
#### Flawed Definitions of Impacts to Natural Soundscapes

The definitions used on page 248 do not adequately reflect the importance of natural quiet.

- No effect ought to mean inaudible. Natural quiet is so rare in general that in a National Park, its presence alone should constitute a unique soundscape. Natural quiet cannot be created; it can only be destroyed. It is a resource that already exists and that the National Parks need to preserve.
- The noise of any internal combustion engine or any amplified noise within a National Park should not qualify for negligible effect. These are artifacts of industrial and urban soundscapes and their presence degrades the park soundscape. These noises are ubiquitous outside of the parks and need to be aggressively abated within parks.
- Audible less than 50% of time is not a minor impact, just as disrupting 50% of the landscape is not a minor impact. Noise is aural litter, and like litter on the park landscape, does not belong on the park soundscape. The categories Minor and Moderate need to be shifted so that the current Minor becomes the new Moderate; the current Moderate becomes the new Major.

Given the value of the Park's natural soundscape, the mandate to protect the natural soundscape, and the rarity of natural quiet, only Alternative 1a of the various options is justifiable. Moreover, if the SEIS had adequately examined the noise footprint of the various vehicles, the number of instances of interference, and the vehicle miles traveled, and if it had given a better comparison of the noise levels of snowcoaches vs. groups of snowmobiles the choice of option 1a would be even clearer. Finally, the definitions of impact do not adequately reflect the importance of the natural soundscape.

Respectfully,

  
 Les Blomberg  
 Executive Director  
 Noise Pollution Clearinghouse  
 Box 1137  
 Montpelier, VT 05601  
 802-229-1659



#### PARK COUNTY ENVIRONMENTAL COUNCIL

May 21, 2002

Winter Use Draft SEIS Comments  
 Grand Teton and Yellowstone National Parks  
 P.O. Box 352  
 Moose, Wyoming 83012

Dear Park Service,

The Park County Environmental Council (PCEC) supports the decision that the National Park Service made back in November 2000—to replace snowmobile use in Yellowstone and Grand Teton national parks with park-friendly, people-friendly snowcoaches. Snowmobiles, which bring noise, exhaust, and impacts to wildlife are not suited to the world's first national park.

Yellowstone's rangers should not have to wear respirators to perform their jobs. Wildlife should not have to contend with stress and commotion caused by tens of thousands of snowmobiles each winter. And visitors should not have to struggle, through a nearly constant roar of machines, to hear Old Faithful geyser.

The question for the American public and government is this: will protection of Yellowstone and Grand Teton National Parks be entrusted to Park Service professionals—from whom the original decision to phase out snowmobiles came after years of research and analysis—or will the future of these parks be handed over to the snowmobile industry?

The new document makes clear again that only a snowcoach system can fully protect Yellowstone and Grand Teton's air quality, natural soundscape, wildlife, employee and visitor health and safety, and visitor experience. If snowmobile use is not phased out, the amount of parkland dominated by the roar and whine of machines will be ten to 20 times greater than visitors would experience with snowcoach access.

The study lays bare that Yellowstone will be noisier, dirtier, and more stressful for wildlife if snowmobile use is allowed to continue. The Park Service made that determination 15 months ago after ten years of scientific study. And on four separate occasions, the public has voiced its approval for phasing snowmobile use out of Yellowstone. The snowmobile industry's only accomplishment over the past 15 months has been to delay protection for Yellowstone National Park and waste \$2.4 million in taxpayers' money.

The alternative backed by the snowmobile industry would spew three times more carbon monoxide and seven times more hydrocarbons into the air of Yellowstone and Grand Teton National Parks than snowcoach access would produce, with rangers wearing respirators, and visitors breathing the same unhealthy air.

Please uphold the law that has protected our national parks since Congress created the Park Service in 1916--by selecting SEIS Alternative 1a. The Environmental Protection Agency has called this the environmentally preferred alternative. I urge you to ensure that Alternative 1a's phase-out of snowmobile use is reflected in the Final Rule for winter use in Yellowstone and Grand Teton.

Thank you for considering the comments of the Park County Environmental Council.

Sincerely,

Jim Barrett  
Executive director



Michelle Chuk  
<mchuk@psr.org>  
05/29/2002 03:50 PM  
AST

To: grte\_winter\_use\_seis@nps.gov  
cc: hsiack@greateryellowstone.org  
Subject: PROTECT THE HEALTH OF THE WORKERS IN YELLOWSTONE  
NATIONAL PARK - Public Comment

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

To Park Service Leaders -

On behalf of more than 20,000 physicians and health professionals throughout the country we would like to respectfully request that you work tirelessly over the next several months to protect human health in Yellowstone National Park. This can be most affectively accomplished by upholding the decision to phase out snowmobiles inside the park, subsequently protecting the health of rangers and visitors from the deleterious effects of snowmobile pollutants including benzene, formaldehyde, and carbon monoxide.

Over the last several years the health of the park employees has been put at risk and we understand that complaints regarding sore throats, runny noses, and burning eyes have been the norm. The situation has gotten so serious that in an effort to help the rangers, the park service has provided fresh air pumps for kiosks and respirators for workers. It is tragic that the air in one of our nation's most beautiful places may pose threats to human health, and that visitors who want to witness the glory and beauty of our first national park in the winter time may run the risk of being affected by poor air quality.

Based on on-going health problems and risks, Physicians for Social Responsibility is not in favor of any roll back of the phase out on snowmobile usage in the park. We believe in not only preserving nature and all that it has to offer, but also in protecting and enhancing human health. Scientists have proven that long-term exposure to air toxics in snow mobile exhaust is dangerous and poses a threat to human health. We must act now to ensure that long-time park employees will not ultimately suffer the consequences of exposure to these chemical pollutants. We believe that the park service has a duty and responsibility to protect visitor and employee health and to provide for the best possible air quality in these Class I airsheds. The park service should move forward with implementing a safer and less-polluting snow coach system.

Sincerely,

Michelle Chuk, MPH  
Public Health Program Director  
Physicians for Social Responsibility



*Saving A Place for America's Predators*

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose WY 83012

To Whom it may concern:

Please accept these comments on behalf of Predator Conservation Alliance for the Yellowstone Winter Use Supplemental EIS. Predator Conservation Alliance is a membership based organization located in Bozeman Montana, representing over 1500 members nationwide. We are dedicated to protecting a place for predators in the Northern Rockies. PCA involvement in the issue of Yellowstone winter use dates back to our signing on as co-plaintiffs in Bison. We strongly supported the decision to phase out snowmobiles as put forth in the previous ROD. After reading the current SEIS, including the EPA's conclusion that snowmobiles should be phased out off Yellowstone we have concluded that there is absolutely no change in circumstances to justify changing the Park Service's stance as set out in the previous ROD. WE are enclosing our previous comments to be included as part of this letter.

Sincerely,

Shawn Regnerus  
Program Associate

PO Box 6/33 • Bozeman, MT 59771 • 406-587-3369 • fax: 406-587-3178  
pca@predatorconservation.org • www.predatorconservation.org

December 13, 1999

Mr. Clifford Hawkes  
National Park Service  
12795 W. Alameda Parkway  
Denver, CO 80228

Re: Yellowstone Winter Use Plan

Dear Mr. Hawkes:

We are writing in response to the Winter Use Plan Environmental Impact Statement (EIS) on behalf of Predator Conservation Alliance (formerly, "Predator Project") and its 1000 members from the northern Rockies and High Plains regions and across the United States. Predator Conservation Alliance works to conserve and restore ecological integrity by protecting predators and their habitats. Its geographic area of focus is the U.S. northern Rockies and High Plains regions, including the Greater Yellowstone Ecosystem. Predator Conservation Alliance was a co-plaintiff in the original lawsuit against Yellowstone National Park for the adverse effects of grooming the park roads for snowmobiles on threatened and endangered species in the park, particularly imperiled predators like the grizzly bear.

We appreciate that the Park Service has finally developed a plan to manage winter use in Yellowstone. Yet, we are concerned that the analysis does not address some of the most important ways that the escalating winter use of Yellowstone affects wildlife and other park resources. We are particularly concerned that the preferred alternative fails to resolve the adverse effects of winter use on wildlife in the park, even those that were identified in the EIS. In fact, none of the proposed alternatives fully provides for the protection of the park's resources that are threatened by winter use. In the absence of a sound alternative by the Park Service, we propose our own.

From the standpoint of the grizzly bear, wolf, lynx, wolverine, and other native predators in Yellowstone Park (and many other of its natural resource values as well), the best alternatives would be either to close the park in winter to motorized use entirely, or to install an elevated monorail system for winter visitors. We believe that the Park Service should seriously evaluate this latter alternative as a long-term goal, but in the short term we acknowledge that neither of these options are feasible. We also acknowledge that Yellowstone and its wildlife need advocates, and opportunities for people to experience Yellowstone in winter in a manner that does not harm the park and its wildlife may be very important to ensuring their ongoing protection. Thus, we support a strengthened "mass transit" alternative, that bans snowmobiles park-wide, but allows the park's roads (other than the East Entrance) to be packed for snowcoaches, with one important caveat: *park roads should only be packed provided that the bison management plan is reformed to tolerate free-ranging bison outside of the park.* The EIS fails to acknowledge that the only effective way to mitigate the adverse effects of packed roads on imperiled wildlife is to address the deficiencies of the current bison management plan, where bison that leave the park on the packed roads are herded and slaughtered at the park border, and shipped out of the ecosystem. The alternative that best

addresses these issues is the "Citizen's Proposal" proposed by Greater Yellowstone Coalition and other conservation groups.

In its comments, Greater Yellowstone Coalition reminds the Park Service of a draft report completed by Mary Meagher (1993), which was mentioned in just one sentence in the 1997 environmental assessment. This and subsequent publications by Meagher provide important information on the influence of winter recreation on bison populations and distributions. The use of the groomed roads has led to energy savings, increased populations, expanded range-use areas, and altered distributions. As bison continue to populate lands on the west side of the park, they are slaughtered by the state of Montana. Thus, bison are not responding to natural conditions, but to a landscape manipulated by humans for recreational and commercial livestock purposes. The Park Service, unfortunately, failed in its analysis to provide any documentation about winter road grooming impacts on bison and associated wildlife. If the Park Service is intent on leaving the park's roadways open to motorized vehicles of any kind, the Park Service and other agencies must first implement changes in the current bison management plan, to mitigate the adverse effects of bison leaving the park in winter via the park's roadways.

#### Scientific Justification for Managing Winter Use

An appendix by James W. Caslick, PhD provides ample evidence for the need to address the current levels of winter use in Yellowstone:

"My review of the literature leaves me with no doubt that winter recreation activities in Yellowstone have affected wildlife behavior and survival, including bison use of groomed snowmobile trails (Aune 1981), and groomed-trail effects on changes in bison movements, habitat use, distribution and calf survival (Meagher 1993). Yellowstone elk have been affected by cross-country skiers (Aune 1981; Cassirer et al. 1992), and in Yellowstone, snowmobiling or cross-country skiers have caused most trumpeter swans to fly (Shea 1979). (p. A-8)

"In regard to wildlife in Yellowstone, I conclude from my literature review that the most pressing [Visitor Use Management] issue is snowmobiling—not snowmobiling in general, but snowmobiling in and near thermally-affected wildlife habitats that are known to be unique and of critical value to wildlife in winter... From my literature review, I conclude that there is now ample documentation to administratively close these thermally-influenced winter habitats, prohibiting winter use by private and commercial snowmachines, skiers, snowshoers, and hikers. (p. A-10)

"To increase protection of these thermally-influenced wildlife habitats in winter and to interrupt the existing network of groomed trails now known to be used by Yellowstone elk and moose (USDI/NPS 1990) and bison (Aune 1981; Meagher 1993), I therefore recommend that private and commercial snowmachine use be permitted in the park only as follows:

- (1) Mammoth to Indian Creek Campground
  - (2) West Entrance to 7-mile Bridge
  - (3) South Entrance to Lewis Lake Campground (4) East Entrance to Sylvan Lake (or Sylvan Pass).
- To further reduce impacts on wildlife, over-snow administrative travel on other park roads should be restricted to the middle hours of daylight (i.e., 10 a.m. to 4 p.m.) to avoid wildlife disturbance during their early morning and evening feeding periods. (p. A-10)

#### Non-motorized use

Our comments focus upon motorized winter use, because it represents the vast majority of winter use in Yellowstone. That said, there is no question that non-motorized winter use may adversely affect the park's wildlife in some areas, and during certain times. We commend the Park Service for its ongoing identification of areas and seasons important to grizzly bears and other wildlife and closing these areas to all human use, and we encourage the Park Service to continue this practice to address non-motorized winter use where it may adversely affect wildlife.

#### East Entrance Road

We share concerns described by Bozeman resident and avalanche control specialist Don Bachman that: "Yellowstone is the only national park unit conducting avalanche control activities to facilitate snowmobile access" (Letter to NPS by Bachman, dated 11/15/99). Bachman identifies the avalanche control at Sylvan Pass as particularly inappropriate, due to the use of a howitzer to bombard avalanche starting zones. Bachman argues that this intensive management is not justified from purely an economic perspective, and we can only speculate at the potential adverse effects on wintering wildlife, particularly grizzly bears, wolverines, or other forest carnivores that happen to use the area. As Bachman nicely summarizes:

"The real value of closing this segment of the park to oversnow motorized use (including snowcoaches) would be the return of a large portion of Yellowstone to a near pristine winter process where there would be only an occasional administrative vehicle, and permitted ski and snowshoe expeditions."

#### Wildlife Concerns

In support of our proposal, we provide a species-by-species account regarding the effects of winter recreation on predators, and specifically grizzly bears, wolves, lynx, wolverines, and their prey.

#### Grizzly Bears

The primary effects of winter use in Yellowstone on grizzly bears is on the bison that are potential prey for grizzly bears. As mentioned above, bison use the packed trails to leave the park, and under the current management policy many of them are killed at the park border, thus lost to the bears as a potentially important food item. The Winter Use EIS fails to address this problem in its analysis, and its preferred alternative might only exacerbate this problem, since a plowed road would make for an even easier travel corridor than a packed trail, and the implementation of mass transit would result in reduced displacement of bison from the park roads. As mentioned in our opening remarks above, short of closing the park roads to all plows and snow-compacting vehicles entirely, the only way to effectively mitigate for this problem is to reform the bison management plan to allow for free-ranging bison outside of Yellowstone Park.

A secondary effect of winter use in Yellowstone on grizzly bears and their prey is the noise and disturbance of people and machines. The direct effects on grizzly bears are minimal so long as the season of use is limited to when bears are typically secure in their dens, and that use is confined to roadways that are well-separated from these den sites. Yet, effects on bison, elk, and other important grizzly bear prey may be significant. Constraining motorized winter use to mass transit is the best way to minimize the potential disturbance of these wildlife due to winter users.

#### Wolves

Wolves remain active year-round, and thus winter use has a high potential of adversely affecting wolves. Restricting snowmobiles to the park's roadways has helped to mitigate potential conflicts, but this may not be sufficient. The results of a study about the impacts of winter recreation on wolves has already driven restrictions in Voyager National Park:

"While the study [in Voyagers National Park] did not prove that winter recreational use harmed wolves, it suggested that the National Park Service should close important wolf foraging areas to winter use until a better understanding of wolf-snowmobile interactions could be determined." (Othiff et al., 1999; p.32)

"In the late 1980's, park wolf researchers found evidence which suggested snowmobile use in some areas disrupt wolf activity. Specifically, the disruption was not considered significant on a case-by-case basis. Concerns with the cumulative effect of repeated disruptions over a winter season, particularly in times of severe winter weather or nutritional stress as a result of reduced prey availability, however, was thought to be important. Based on research information and consultation with the USFWS in 1992, the park delineated 17 restricted use areas in major lake bays later that year. The park then began to document winter wolf, snowmobile, and other wildlife activity in restricted use areas through an aerial monitoring program." (USD1, 1996)

Predator Conservation Alliance supports banning winter use in ungulate winter ranges, and restricting the season of winter use to eliminate the risk of conflict during the critical denning period for wolves, as recommended in the report referenced in the EIS:

"New winter recreational developments should not be built near ungulate winter ranges or where they would impede wolf movements between high-quality habitats. Moreover, existing destination areas should be closed by April 1 to prevent the displacement of wolves during critical denning periods... Grooming and use of snowmobile roads and trails should end between March 15 and April 1, allowing wolves to use spring denning sites without harassment." (p.33)

Further, we support restricting motorized winter use to mass transit, to reduce the potential displacement and harassment of wolves themselves that may range in proximity to the park's roads, and the bison and elk that the wolves depend on for their prey.

#### Lynx

Like wolves, lynx are also active during winter, and the Park Service report referenced in the EIS nicely summarizes potential conflicts posed by winter use, and snowmobiling in particular:

"Snowmobiling may be particularly adverse to lynx because: (1) this activity occurs when animals are frequently in poor condition due to the stresses of winter (Anderson 1995); (2) this activity may be dispersed on the landscape (i.e., not confined to roads) on national forest lands outside of wilderness areas; (3) it may occur at night when lynx are usually active; (4) it is frequently accompanied by human disturbance and habitat loss associated with recreational infrastructure; and (5) this activity may alter the density and distribution of snowshoe hares, a favored prey item. In Ontario, Canada, snowmobile activity altered the mobility, distribution, and movements of hares (Neuman and Merriam 1972). Road plowing, grooming, and construction activities that support snowmobilers may also significantly reduce the effectiveness of winter lynx habitats. In this regard, road density and the level of automobile use are important considerations because they affect the frequency and intensity of disturbance." (p.56)

An additional concern is that packed trails may allow access into lynx habitat for its competitors — mountain lions, bobcats, and coyotes — that otherwise would be unable to travel through the deep, soft snow to compete for the lynx's prey (e.g., USD1 1998, pp. 37006, 37008).

Within Yellowstone, these adverse effects are mitigated by the restriction of snowmobiles to roadways, but again that may not be sufficient. To reduce the risk of displacement and harassment during winter to lynx themselves and to their prey, we favor restricting motorized use to mass transit.

#### Wolverines

Wolverines are known to inhabit Yellowstone Park, and are active year-round, and thus winter recreation must be managed with their needs in mind. Idaho Department of Fish and Game researcher Jeff Copeland has documented the sensitivity of wolverines to people, particularly in their natal denning areas during winter (Copeland, 1996). While this risk is much reduced in Yellowstone by confining use to the park's roadways, some aspects of the current use may

adversely affect wolverines, such as the grooming and use of the east entrance road over Sylvan Pass, and the associated avalanche control (see above, "East Entrance Road"). Indirect effects on wolverine due to effects on their prey may be significant as well. Thus, we favor restricting motorized use to mass transit, and closing the east entrance road to all private and commercial motorized use.

#### Scientific Study

We strongly encourage the Park Service to continue and increase its efforts to generate sound, scientific information on the effects of winter recreation on wildlife. This issue is escalating within national parks and on public and private lands across the country, and managers could benefit from information that Yellowstone may be uniquely situated to provide. We encourage the Park Service to implement closures to all users where needed to generate good information, because we are confident that the long-term value of this information outweighs the short-term political and economic costs of these closures.

#### Social and Legal Concerns

The National Park Service Organic Act states that the purpose of the National Parks is "to conserve the scenery and the natural and historical objects and the wildlife therein." (16 USC § 1) The National parks were also created for the public's enjoyment, but only "in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." (Id) Contrary to the requirements of the Organic Act, the use of snowmobiles has placed the enjoyment of snowmobile users over the protection of Yellowstone's scenery and wildlife as well as the enjoyment of other park visitors. In addition to the previously mentioned impacts on wildlife, snowmobile use causes significant noise and air pollution. In fact, levels of carbon monoxide measured between West Yellowstone and Madison junction during 1996 were significantly higher than the highest levels of carbon monoxide measured anywhere in the United States during 1995. When snowmobile use is allowed to the extent that it causes air and noise pollution levels in Yellowstone National Park to exceed the levels in our large urban areas, the park is no longer unimpaired for the enjoyment of future or even present generations.

Yellowstone was set aside for the public to enjoy its unique natural wonders, not to provide a playground for snowmobiles. During the winter, the wildlife and thermal features that inspired the creation of Yellowstone National Park are part of a landscape unmatched anywhere else in the world. The American public should be able to view this spectacle without having to endure the pall of blue smoke and overpowering whine created by snowmobiles. Snowmobilers represent a small percentage of the public, even in the states surrounding the park. Under the park's current management scheme, it is impossible to experience the park during the winter without experiencing the sound and smell of snowmobiles. The park service cannot continue to allow a small minority to dictate the winter experience of Yellowstone for the rest of the public. If the park service truly wants to provide a means for the general public to enjoy the unique winter experience of Yellowstone National Park, the mass transportation alternative will allow the public to visit Yellowstone without the impacts of snowmobiles. The experience of snowmobiling in the park itself might be eliminated, but the public's experience of the scenery and wildlife that Yellowstone was created to protect will be greatly enhanced.



Thank you for preparing an analysis of winter use in Yellowstone, and for the opportunity to comment. Please keep us informed of any developments on this issue.

Sincerely,

David Gaillard, Coordinator  
Forest Predator Campaign

Shawn Regnerus, Coordinator  
Roads Scholar Campaign

Cc: Kemper McMaster, Mike Long, U.S. Fish and Wildlife Service  
Eric Glitzenstein, Attorney  
D.J. Schubert, Consultant  
Fund for Animals  
Greater Yellowstone Coalition  
Jackson Hole Conservation Alliance  
National Parks Conservation Association

#### Literature Cited:

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- Olliff, T., K. Legg, and B. Kaeding, editors. 1999. Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee, Yellowstone National Park, Wyoming, 315 pp.
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- U.S.D.I., October 1996. Restricted winter use report: Voyageurs National Park. U.S. Department of Interior, National Park Service, International Falls, Minnesota, 20 pp.

#### Winter Use Draft SEIS Comments

Grand Teton and Yellowstone National Parks  
P.O. Box 352  
Moose, Wyoming 83012  
Via email: [gte\\_winter\\_use\\_seis@nps.gov](mailto:gte_winter_use_seis@nps.gov)

May 29, 2002

RE: Winter Use Draft SEIS Comments

Dear Park Service:

**Public Employees for Environmental Responsibility (PEER) supports the National Park Service's decision to phase out snowmobile use from Yellowstone and Grand Teton National Parks. We support a snowcoach transportation system, which will minimize wildlife harassment, reduce air and noise pollution, and protect employee and visitor health and safety. This decision will safeguard employee health and safety as well as protect the parks for current and future generations to use and enjoy.**

PEER is a national, nonprofit alliance of local state and federal resource professionals—scientists, land managers and resource officers—dedicated to upholding environmental laws and values. PEER is a service organization for government employees and contractors charged with safeguarding the nation's natural resources. PEER works with and on behalf of employees on the inside to affect change in the way their resource agencies conduct the public's business.

#### Snowmobile Pollution Negatively Impacts the Health of the Employees

##### And the Public.

In Yellowstone, concern about public health and excessive snowmobile pollution were issues raised in over 1,200 snowmobile complaint letters received by the park in 1993 and 1994. As a result, Yellowstone began to study snowmobile emissions and soon found that carbon monoxide (CO) and particulate matter (PM) concentrations were high enough to cause health and air quality concerns in West Yellowstone, along the snowmobile trail to Old Faithful, and in the parking lot at Old Faithful (NPS Air Quality Division 1995). Park visitors have reported tasting the visible haze surrounding the busy entrances and trailheads.

The Park Service repeatedly acknowledges the deleterious effects to health and air quality caused by snowmobiles in NEPA documents.

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces

the delivery of oxygen to the body's organs and tissues. Health effects range from impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks; to headaches and fatigue; to respiratory failure and death.

DSEIS at 100. Science supports these conclusions. Carbon monoxide is particularly dangerous because it binds to the hemoglobin in blood (forming carboxyhemoglobin) and renders hemoglobin incapable of transporting oxygen (Snook-Fussell 1997). Elevated levels of carboxyhemoglobin can cause neural-behavioral effects at lower levels (2-3 percent), headaches and fatigue (10 percent), and respiratory failure and death at higher levels. And the general consensus among medical professionals is that the health risk from CO increases at high altitude—a risk exacerbated by richer fuel mixtures common at higher elevations. CO is particularly hazardous during pregnancy, and to the elderly, children, and individuals with asthma, anemia or other cardiovascular disease (EPA 1991; 1994).

Furthermore, the DSEIS states at 100 that the increasing number of snowmobiles in the parks generates dangerous particulate matter.

In addition to CO emissions, snowmobiles generate particulate matter (PM) and volatile organic compounds (VOCs). VOCs include air toxics or hazardous air pollutants such as benzene and formaldehyde. Vehicle exhaust PM emissions also contain hazardous air pollutants such as 1,3-butadiene. Health effects from PM emissions include reduced lung function, aggravation of respiratory ailments, long-term risk of increased cancer rates, and development of respiratory problems. Snowmobile emissions have been the source of the vehicle emission and health related complaints in YNP. Snowmobilers, rangers and other park visitors are exposed to dangerous levels of CO.

The National Ambient Air Quality Standards for CO of 35 ppm for 1 hour and 9 ppm for 8 hours were established to keep blood levels of carboxyhemoglobin below 3 percent. Notably, some scientists have criticized these standards because of evidence of adverse health effects even at these levels (Watson 1995, Greek and Dorweiler 1990). In Grand Teton National Park, Fussell-Snook (1997) measured the amount of CO emitted from a snowmobile on a Park trail under steady-state conditions. An average of 9.9 g/mile (99 g/hr) to 19.9 g/mile (795 g/hr) of CO was emitted by one snowmobile traveling from 10 to 40 mph. By comparison, an automobile emits 0.01 to 0.04 g/mile of CO under steady-state conditions, or approximately 1,000 times less than a snowmobile.

The average CO measurements for a single snowmobile, recorded at different speeds and distances (25-125 feet), ranged from 0.5 - 23.1 ppm. The Montana state one-hour human exposure limit for carbon monoxide is 23 ppm. It is important to reemphasize that these measurements were based on a single snowmobile only, during steady-state conditions. Unfortunately, snowmobiles travel in packs of 2-25 units for sustained periods of time, and often accelerate over hills and banks. It is therefore clear that typical human exposure to CO is of a much greater magnitude, and represents a very

significant level of toxic pollution.<sup>1</sup> The results are particularly alarming for rangers and recreationists at trailheads, gas stations, and park entrances, where one hundred snowmobiles can create the equivalent carbon monoxide of more than 100,000 cars.

#### **Park Employees are Particularly Negatively Impacted by the Adverse Pollution And Additional Impacts Caused by Snowmobiles.**

Yellowstone has been forced to enclose ranger booths at its West Entrance to protect rangers from dizziness, nausea, fatigue, headaches, and breathing problems. Fresh air is pumped into entrance kiosks where rangers have reported effects such as difficulty counting change. Rangers have reported joint aches from patrolling the routes that have become rutted from the heavy use of visiting snowmobiles, as well as concern for their safety, from the increasing number of novice, high speed and daredevil snowmobile drivers in the park.

In conducting routine tasks, employees can be regularly and recurrently exposed to the hazards of loud sounds, exhaust emissions, repetitive motions, spinal and musculature impacts from traveling extremely rough roads, avalanches, and sharing the roadway with inexperienced and unsafe snowmobilers. OSHA measured exposures in several work place environments over a single week in February 2000. They found high levels of noise, carbon monoxide, benzene, formaldehyde and severe shaking and vibration to employees riding snowmachines during the performance of their work duties. The NPS requires employees in the interior YNP, as part of their duties, to be in the travel corridors. It is not an occasional, optional exposure for employees working in the interior of YNP.

DSEIS 112-113.

Complaints of nausea, dizziness, headaches, sore throats, eye irritation, light-headedness, and lethargy are frequent among employees who work at the West Entrance and other who work within the more heavily used travel corridors. OSHA found that an employee working the express lane, primarily outside the kiosk booth at the West Entrance, was overexposed to benzene and formaldehyde, both known carcinogens, as an 8-hour-time-weighted average and overexposed to carbon monoxide as a peak concentration. DSEIS at 11. **This winter, in an attempt to address employee health complaints, employees were outfitted with respirators to minimize exposure. Respirators did not help with carbon monoxide exposure.**

Furthermore, the Park Service failed to analyze synergistic health effects, effects on vulnerable populations and effects on employees who have worked under these conditions for many years.

The DSEIS they noted the significant health impacts from winter use in the Parks however it fails to consider the effects of the multiple agents acting together. EPA has expressed this concern in EPA Comments to the Park Service on Yellowstone and Grand Teton Winter Use, April 23, 2002, questioning, "the potential additive or synergistic toxic effects due to exposure to multiple chemicals." Citing the mixture of constituents

that may effect an individual, EPA states,

as a result, the synergistic impacts may be greater or less than the additive impacts from multiple human toxins. In another example, CO, benzene and formaldehyde have all been documented at elevated levels in the Parks. These three chemicals are all associated with neurological effects such as headaches, nausea, dizziness, or central nervous system depression

**The Park Service has a duty to protect employee and visitor health and safety from the debilitating effects of carbon monoxide and particulate matter produced by increasing numbers of snowmobiles.** As a federal employer, the NPS has a responsibility under OSHA to protect employee health from the cited effects of CO and PM. Snowmobile use in the parks can cause concomitant impacts to air quality endanger park visitors and employees with respiratory and other ailments and chemical sensitivities. Current snowmobile use precludes the parks' ability to ensure a clean, healthy environment for visitors and a healthy workplace for employees, as required by law.

**Alternative 1a will Provide the Best Protection to Employees and Public Health and Therefore, Should be Selected by the NPS.**

NPS found the publics' and employee health and safety to be at risk from snowmobile use, as disclosed in the Final Environmental Impact Statement (EIS), Record of Decision (2000) and Final Rule (2001). The Draft Supplemental EIS (2002) reconfirms the previous findings—that employee health and safety can only be assured if snowmobiles are phased out as planned under Alternative 1a.

The DSEIS states that Alternative 1a provides best compliance with NPS regulations and policy for public and employee health due to CO and PM exposure and safety concerns.

Exposure to pollutants and sounds at the West Entrance would be significantly reduced. Additionally, fewer numbers of oversnow vehicles on the roads would help to maintain a smoother road surface and reduce the number of needed ranger patrols. This would minimize injuries to employees caused by the jarring of a bumpy road surface. Employees would also not be exposed to unsafe operation of snowmobiles.

DSEIS at 168.

Furthermore, the DSEIS is clear that upholding the snowcoach alternative "would achieve the greatest improvement relative to the existing condition... With the fewest numbers and types of vehicles operating at speeds and schedules that minimize risk of incident", a snowcoach system is safer than continued snowmobile use. Upholding the snowcoach decision would also "produce the lowest emissions levels." DSEIS at xi.

**EPA also concludes that the snowcoach mode of visitor transportation is the most protective of public and employee health.** EPA Comments to the Park Service on

*Yellowstone and Grand Teton Winter Use*, April 23, 2002

**In summary, Rangers should not have to wear respirators, visitors should be able to enjoy peace and quiet, and wildlife should not have to contend with harassment from tens of thousands of machines each winter. There is a great national interest in protecting these magnificent parks. This should not be jeopardized on behalf of the snowmobile industry.**

**The Park Service's decision to phase out snowmobile use in the two national parks was based on the best science as demonstrated by the conclusions of the EIS, DSEIS, and EPA. There is no reason to wait another decade to improve public health and air quality within the Class I airsheds of Yellowstone and Grand Teton national parks therefore, PEER requests the Park Service uphold the science and judgment of your own professionals by selecting SEIS Alternative 1a.**

Sincerely,

**Chandra Rosenthal  
Director, Rocky Mountain PEER**

<sup>1</sup> In addition, the impact of CO exposure increases with increasing altitude, especially for unacclimated individuals (National Commission on Air Quality 1980). Thus, because much snowmobile use occurs at higher altitudes, risks to human health are even greater.

**ROCK THE EARTH**  
**102 Dogwood Lane**  
**Pittsburgh, Pennsylvania 15237**

May 29, 2002

Winter Use Draft SEIS Comments  
 Grand Teton and Yellowstone National Parks  
 P.O. Box 352  
 Moose, WY 83012

**Re: Winter Use Plans, Supplemental Draft Environmental Impact Statement ("SEIS") for the Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr. Memorial Parkway.**

Dear Sir or Madam:

We, the undersigned members of an unincorporated not-for-profit group of concerned citizens, are writing to you to comment on the alternatives proposed in the draft Winter Use Plans, Supplemental Draft Environmental Impact Statement ("SEIS") for the Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr. Memorial Parkway (jointly, the "Parks"). It is our opinion based on all of the evidence in the public record, that the National Park Service ("NPS") and U.S. Department of the Interior made the correct decision when they published the Final Environmental Impact Statement ("FEIS") and Record of Decision for the Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr. Memorial Parkway ("ROD") on November 22, 2000,<sup>1</sup> eliminating recreational snowmobile and snowplane use from the Parks by the winter of 2003-2004, was the correct decision. Further, it is our belief that no new information contained within the SEIS record warrants any alteration of those remedies recommended and adopted in the FEIS and ROD. Therefore, in commenting on the SEIS, it is our view that the NPS should reaffirm the remedies adopted by the ROD and adopt alternative 1a.

**I. Rock the Earth.**

Rock the Earth is an unincorporated not-for-profit group of concerned citizens who regularly utilize the national park system, year-round, for recreational activities. Its members regularly seek the peace, quiet and solitude of the national park system for reflection, spiritual inspiration, and exercise, while engaging in recreational activities which include hiking, camping, photography, meditation, cross-country skiing and non-motorized water sports. Its members will be directly affected by the decision concerning the SEIS in that a decision by the NPS to allow continued snowmobile usage within the

<sup>1</sup> As modified by the final rule published in the Federal Register on January 22, 2001.

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Parks will diminish visitors'/members' ability to experience the Parks in their natural state, thereby reducing visitor enjoyment.

Rock the Earth members have several grounds for concern. Among the organization's primary rationale is the actuality that Yellowstone and Grand Teton National Parks are our parks and we are obliged to protect them. The two areas are prominent among the meager segment of the Earth that remains for the activities we as individuals revere. It is our collective conclusion that as informed citizens, it is our responsibility to present this case for protecting these treasured fragments of the Earth. Any permanent interruption of the pleasures we obtain at Yellowstone and Grand Teton National Parks is intolerable. We agree that continued use of snowmobiles in these pristine areas will devastate the naturally wild environment. High air quality, untainted wildlife habitat, raw terrain and an aura of silence are critical to the bliss we have discovered in the parks. Therefore we find it not only our right, but also our responsibility to be concerned.

**II. NPS Mandates Require that Snowmobiles and Snowplanes be Banned from the Parks.**

The NPS is guided by the United States Constitution, public laws, treaties, proclamations, Executive Orders, regulations, directives of the Secretary of the Interior and Assistant Secretary for Fish and Wildlife and Parks, as well as NPS guidance documents.

**A. The laws directing the NPS activities support SEIS alternative 1a.**

The fundamental purpose of the National Park System as set forth in the Organic Act, 16 USC 1, 2-4, and reaffirmed by the General Authorities Act, 16 USC 1a-1 through 1a-8, *as amended* ("Organic Act"), mandates the conservation of park resources and values. The Organic Act of 1916, *as amended*, states in Section I:

The Service thus established shall promote and regulate the use of the Federal areas known as the National Parks...by such means and measures as to conform to the fundamental purposes of the said Parks...which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.

16 USC 1, 2-4. Likewise, the General Authorities Act, as amended by the Redwood Act (March 27, 1978, P.L. 95-250, 92 Stat. 163, 16 U.S.C. 1a-1) ("General Authorities Act"), affirms the basic tenets of the Organic Act and provides additional guidance on National Park System management:

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The authorization of activities shall be construed, and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established.

16 USC 1a-1 through 1a-8, *as amended*. Finally, the federal Clean Air Act, [CITE] ("CAA") also provides that federal land managers are to "assume an aggressive role in protecting the air quality values of land areas under his jurisdiction" and to "err on the side of protecting the air quality-related values for future generations." The CAA also requires the prevention of any future impairment and the remedying of any existing impairment in Class I federal areas, which includes Yellowstone and Grand Teton National Parks.

Therefore, based on the "Organic Act and the General Authorities Act, both of which demand that areas designated as National Parks be conserved, preserved and that uses contrary to these principals must not be allowed, along with the fact that the CAA requires the elimination of uses which impair air quality, the NPS should adopt Alternative 1a eliminating the use of snowmobiles in the Parks.

Looking beyond statutory law, Executive Orders also support a conclusion that Alternative 1a should be the selected option in this case. Areas and trails for off-road vehicle use shall be located in areas of the national park system only if the agency head determine that off road vehicle use in such locations will not adversely effect their natural, aesthetic or scenic values. Executive Order 11644, Use of Off-Road Vehicles on the Public Lands, 37 FR 27 (1972); *See also* ROD, at 12. Executive Order 11644 was amended by Executive Order 11899, Off Road Vehicles on Public Lands, 42 FR 101 (1978), which states:

[t]he respective agency head shall, whenever he determine that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, immediately close such areas or trails to the type of off-road vehicle causing such effects.

Executive Order 11899, 42 FR 101 (1978).

Federal regulations similarly limit the use of snowmobiles on national park lands. The primary federal regulation that addresses snowmobile use is found at 36 CFR §2.18, which generally prohibits the use of snowmobiles on National Parklands, except where designated and "only when their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, *and will not*

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*disturb wildlife or damage park resources.*" 26 CFR §2.18(c) (emphasis added).<sup>2</sup> The restatement of these principles in the Redwood Act is intended to serve as the basis for any judicial resolution of competing private and public values. In the Redwood Act, Congress provided that when there is a conflict between conserving resources and values and providing for the enjoyment of them, conservation is to be the primary concern. 16 U.S.C. 1a-1; *See also* ROD, at 12.

Finally, National Park Service guidance documents and policy interpreting the laws, regulations and Executive Orders supports the selection of the recommended remedy in the FEIS and ROD, and therefore supports the selection of Alternative 1a. NPS Management Policy 1.4.3 contains an NPS obligation to "conserve and provide for enjoyment of park resources and values." Contained within this management policy is the mandate that the NPS managers "must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources" and "when there is a conflict between conserving resources and providing for enjoyment of them, conservation is to be predominant."<sup>3</sup> *See* NPS Management Policy 1.4.3; ROD, at 13.

The NPS Management Policies also prohibit the impairment of park resources and values, thus ensuring that the parks will continue to exist in a condition that "will allow the American people to have present and future opportunities for enjoyment of them." *See* NPS Management Policy 1.4.4 (The Prohibition on Impairment of Park Resources and Values).<sup>4</sup>

Other substantive NPS Management Policies that support the basis for this comment letter can be found in NPS Management Policies 4.7.1 (Air Quality),<sup>5</sup> 4.9 (Soundscape Management),<sup>6</sup> 8.2 (Visitor Use),<sup>7</sup> 8.2.3 (Use of Motorized Equipment),<sup>8</sup> 8.2.3.1 (Off-road Vehicle Use),<sup>9</sup> and 8.2.3.2 (Snowmobile Use).<sup>10</sup>

<sup>2</sup> In addition to the regulatory requirements found in 36 CFR 2.18, it is important to note that regulatory changes were also made to enact the recommendations in the 2000 FEIS and the ROD. *See* 36 CFR §7.13 (k) (Yellowstone National Park); 36 CFR §7.21(a) (John D. Rockefeller, Jr. Memorial Parkway); 36 CFR §7.22(g) (Grand Teton National Park).

<sup>3</sup> "Resources and values" have been defined by the NPS in NPS Director's Order #55, to include the ecological, biological and physical processes that created the park, scenic features, natural visibility, natural soundscapes, water and air resources, native plants and animals, the park's role in contributing to national dignity, the high public value and integrity, and the benefit and inspiration provided to the American people by the national park.

<sup>4</sup> What constitutes an "Impairment" of park resources and values is defined in NPS Management Policy 1.4.5. What constitutes "Park Resources and Values" is defined in NPS Management Policy 1.4.6. *See also* NPS Director's Order #47 (natural soundscapes).

<sup>5</sup> NPS Management Policy 4.7.1 (Air Quality), requires the NPS to seek to perpetuate the best possible air quality in the Parks to: 1) preserve natural resources and systems; 2) preserve cultural resources; and 3) sustain visitor enjoyment, human health, and scenic vistas.

<sup>6</sup> NPS Management Policy 4.9 (Soundscape Management), requires the NPS to preserve, to the greatest extent possible, the natural soundscapes of parks, to restore degraded soundscapes to the natural condition wherever possible, and to take action to prevent or minimize all noise that, through frequency, magnitude or duration, adversely affects the natural soundscape. *See also*, ROD, at 13.

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**B. The standard of review mandates that the NPS select SEIS alternative 1a.**

In November 2000, after over ten years of consideration and study, thousands of public comments and litigation, the NPS published the ROD for Winter Use Plans for Yellowstone and Grand Teton National Parks ("GTNP") and the John D. Rockefeller, Jr., Memorial Parkway.<sup>11</sup> In that ROD, the decision was made to adopt the alternative for Winter Use which emphasized cleaner, quieter access to the parks, allowing oversnow motorized recreation access via NPS-managed snowcoach only, with limited exceptions for continued snowmobile access to other public and private lands adjacent to or within GTNP. The decision addressed the full range of issues regarding safety, natural resource impacts, and visitor experience and access in a way that made it necessary for local economies to adapt, and for snowmobile users to access the parks using a different mode of transport.<sup>12</sup>

<sup>7</sup> NPS Management Policy 8.2 (Visitor Use), guides the NPS to prohibit conduct or activities which would impair the park resources or values, create unsafe or unhealthy environment for other visitors or employees, are contrary to the purposes for which the park was established, or unreasonably interfere with the atmosphere or peace and tranquility, or the natural soundscape maintained in wilderness.

<sup>8</sup> NPS Management Policy 8.2.3 (Use of Motorized Equipment), states that the NPS will strive to preserve or restore the natural quiet and natural sounds associated with the physical and biological resources of parks.

<sup>9</sup> NPS Management Policy 8.2.3.1 (Off-road Vehicle Use), states that routes and areas may be designated for off-road motor vehicle uses only in locations where there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values and in consideration of other visitor uses.

<sup>10</sup> NPS Management Policy 8.2.3.2 (Snowmobile Use), states that:

NPS administrative use of snowmobiles will be limited to what is necessary to manage public use of snowmobile routes and areas; to conduct emergency operations; and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means.

<sup>11</sup> About 2,000 public comment letters were received in response to the Scoping brochure, from which about 15,000 discrete comments were obtained. Scoping respondents included: businesses; private and nonprofit organizations; local, state and federal agencies; and the public at large. Comments to the Scoping brochure were received from 46 states and several foreign countries. ROD, at 22. In response to the draft Environmental Impact Statement ("EIS"), over 48,000 pieces of correspondence were received, consisting of individual letters, form letters, e-mails, telephone calls, and hearing presentations. ROD, at 26.

<sup>12</sup> ROD, at 2. "In arriving at this decision, I have considered the detailed analysis of the effects in the FEIS for a range of alternative plans that would govern winter use. I have considered how each alternative responds to the purpose and need for action, to improve existing conditions in the parks and move them toward a desired condition that is implicit in NPS mandates. In doing so, I considered the impacts for each alternative program and weighed them against affirmative direction for protecting park resources and values, and their enjoyment by future generations, from adverse impacts or impairment. I also considered the degree to which each alternative would enhance the condition of resources or values and their enjoyment. Other considerations include socioeconomic impacts, effects on lands adjacent to the three parks, the plans or desires articulated by the local communities and nonfederal governments, and the full body of public comments on the draft EIS. ROD, at 10-11. See also, ROD, at 16 (Economic Impact on Local Communities); ROD, at 17-18 (Public Comments on the Draft EIS).

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NPS Management Policy 1.4.7, contains the standard that the NPS must apply in decision making to avoid impairments of the Parks. Given the fact that the FEIS and the ROD both concluded that snowmobiles and snowplanes in the Parks are impairing the Parks' resources and values, and specifically concluded that these vehicles must be banned from the Parks except in certain limited circumstances, NPS Management Policy 1.4.7 contains the standard of review that must be applied in this case. NPS Management Policy 1.4.7 states:

Before approving a proposed action that could lead to an impairment of park resources and values, an NPS decision-maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. *If there would be an impairment, the action may not be approved.*

NPS Management Policy 1.4.7 (emphasis added). Furthermore, in making a decision, the decision-maker must consider any environmental assessments or environmental impact statements required by the National Policy Act of 1969 ("NEPA") [CITE]; relevant scientific studies, and other sources of information and public comments.<sup>13</sup> Finally, if it is determined that there is, or will be, such an impairment, the Director must take appropriate action, to the extent possible within the NPS' authorities and available resources to eliminate the impairment as soon as is reasonably possible.<sup>14</sup>

The SEIS presents four alternatives for winter visitor use in the three park units evaluated in the SEIS. Two of the alternatives (alternatives 2 and 3) would overturn the previous ROD and FEIS and specifically allow snowmobile recreation to continue in the parks. Alternative 1a was the selected alternative in the ROD, as modified by the final rule published in the *Federal Register* on January 22, 2001. Alternative 1b is the same as Alternative 1a, but defers implementation for one more year (to 2004-2005).

Therefore, in accordance with NPS Management Policy 1.4.7, in order for the NPS to now select either alternative 2 or 3, both of which will allow for snowmobile recreation to continue in the parks, the Director must now find that such activities will not cause an impairment of park resources. In light of the FEIS and ROD, both of which held that continued snowmobile and snowplane usage in the Parks caused an impairment of park resources and values, the Director will be unable to conclude that such activities will not cause an impairment—which would be necessary for the selection of either alternative 2 or 3.

Further, as noted above, NPS Management Policy 1.4.7 also mandates that once it is determined that certain activities are causing an impairment to park resources or

<sup>13</sup> NPS Management Policy 1.4.7.

<sup>14</sup> *Id.*

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values, corrective actions *must* be taken to eliminate the impairment *as soon as is possible*. The final rule published on January 22, 2001, phased out such sources of impairment by the 2003-2004 winter season. It had been determined by the Director and NPS that the impairment could be corrected by that time. Nothing in the SEIS and supporting appendices supports extending that deadline and delaying the corrective actions that must be taken to remove that impairment. Therefore, in accordance with the mandates in NPS Management Policy 1.4.7 and in light of the impairment to the parks and the corrective action mandated in the FEIS and ROD to remove the impairment to the Parks by the 2003-2004 winter season, the NPS must select Alternative 1a and not delay the implementation of the recommended corrective action set forth in the FEIS and ROD.<sup>15</sup>

### III. The Negative Impact that Snowmobiles and Snowplanes Have on Visitor Experience Warrants the Selection of Alternative 1a.

NPS Management Policy 8.2 sets forth the standard that the NPS is to follow to insure that visitors' uses of the parks are being adequately protected. At the outset, that Policy states: "Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of the parks." NPS Management Policy 8.2. To provide for enjoyment of the parks, the NPS will encourage visitor activities that:

- Are appropriate to the purposes for which the park was established;
- Are inspirational, educational, or healthful and otherwise appropriate to the park environment; and
- Can be sustained without causing unacceptable impacts to park resources or values.

NPS Management Policy 8.2. Furthermore, the NPS will not allow visitors to conduct activities that:

- Would impair park resources or values;
- Create an unsafe or unhealthy environment for other visitors or employees; or
- Unreasonably interfere with: the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic or commemorative locations within the park.

<sup>15</sup> In addition, in a Letter of April 23, 2002, from Max H. Dodson, Assistant Regional Administrator for Ecosystems Protection and Remediation, EPA Region 8 to Steven F. Iobst, Assistant Superintendent, Grand Teton National Park, EPA states that selection of Alternatives 1b, 2 or 3 will likely result in non-compliance with AQ standards. See Letter of April 23, 2002, from Max H. Dodson, Assistant Regional Administrator for Ecosystems Protection and Remediation, EPA Region 8 to Steven F. Iobst, Assistant Superintendent, Grand Teton National Park.

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### NPS Management Policy 8.2.

Over 140,000 people visit the Parks during the winter season, and while visitors have a range of winter recreation opportunities, ranging from primitive to developed, it is the NPS' obligation to ensure that such recreational experiences are offered in an appropriate setting—that such experiences do not take place where they will irreparable impact air quality, wildlife, cultural areas or the experiences of other parks' visitors, or other parks' values and resources.<sup>16</sup> By all accounts snowmobile use, in current numbers, is in conflict with the use of the parks' facilities by other user groups.<sup>17</sup> For trails open to both motorized and non-motorized users, non-motorized users express dissatisfaction with the sound, odor, and quantity of snowmobiles. These vehicles affect the solitude, quiet, clean air, and other resource values that many people expect and wish to enjoy in national parks.<sup>18</sup> Parks have documented health hazards from snowmachine emissions, harassment and unintended impacts on wildlife from groomed trails and their use, degradation of air-quality-related values and impacts on the natural soundscape.<sup>19</sup> Many people strongly object to the degradation of inherent parks' values, as well as how these impacts affect people and their recreational opportunities.

One aspect of a visitor's experience in the Parks is the amount of access to the Parks that the visitor will have. Impacts form a range of alternatives on visitor access and circulation were disclosed in the FEIS and the ROD. Ultimately, both SEIS proposed alternatives 1a and 1b provide for an identical amount of visitation via snowcoaches to all areas of Yellowstone National Park ("YNP") that are currently accessible by oversnow motorized means.<sup>20</sup> Under NPS policies, however, the visitor experience is more a function of the *quality* of the resources and values in the park setting, and less associated with the mode of transportation.<sup>21</sup>

As is outlined in Chapter IV of the SEIS, opportunities to view wildlife<sup>22</sup> and scenery would not be reduced for YNP through the implementation of alternative 1a.<sup>23</sup> As for Grand Teton National Park ("GTNP") and the John D. Rockefeller, Jr. Parkway (the "Parkway"), there would only be negligible to minor adverse impacts on visitor experience relating to wildlife and scenery viewing due to the elimination of motorized travel on the frozen surface of Jackson Lake.<sup>24</sup>

<sup>16</sup> See FEIS, Chapter I, page 6.

<sup>17</sup> *Id.*, at 7.

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> SEIS, Chapter IV, at 251.

<sup>21</sup> *Id.*, at 252.

<sup>22</sup> Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. SEIS, Chapter IV, at 255; See also SEIS, Volume I, Table S-2.

<sup>23</sup> *Id.*

<sup>24</sup> SEIS, Chapter IV, at 259-261; See also SEIS, Volume I, Table S-2. However, opportunities to view wildlife would be improved for nonmotorized users of these areas.

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Furthermore, there would be a major beneficial effect on visitors' ability to experience natural quiet and solitude through the implementation of alternative 1a.<sup>25</sup> In addition, there would be a major reduction in vehicle emissions that would provide a major beneficial improvement in opportunities to experience clean air in all three Parks.<sup>26</sup>

Alternatives 2 and 3 provide for continued snowmobile access to the Parks (albeit at limited numbers). However, when compared with the FEIS-chosen alternative (Alternative 1a) or the delayed FEIS-chosen alternative (Alternative 1b), both Alternatives 2 and 3 would still lead to diminished visitor experiences, diminished quiet and solitude to many visitors (despite a required use of new technology/ quieter machines), and decreased opportunities to experience clean air, especially on peak days.<sup>27</sup>

Overall, Alternative 1a, provides for major improvements to visitors' respective experiences in the shortest possible timeframe. But, as will be demonstrated further, implementation of Alternative 1a will also result in expeditious improvements to air quality and improvements on the natural soundscapes of the Parks, so as to in turn, improve the majority of visitors' overall experience and remove the impairment to park resources in the shortest possible time.

#### IV. The Negative Impact that Snowmobiles and Snowplanes Have on Air Quality Warrants the Selection of Alternative 1a.

As was demonstrated in the FEIS and ROD, the effect of snowmobile emissions on air quality was identified as a primary concern for visitors, with respect to health, natural resources, and aesthetic and wilderness values.<sup>28</sup> For example, on high snowmobile use days in YNP, the visual evidence and odor of snowmobile exhaust was apparent in some areas.<sup>29</sup> In selecting the original alternative in the FEIS banning snowmobiles from the Parks by 2003-2004, the NPS concluded that there would be major beneficial effects in air quality in the Parks.

Likewise, in selecting Alternative 1a, the Parks would see the greatest improvement to air quality in the shortest period of time. In fact, the SEIS flat-out states, "Compared to the existing condition in which unregulated snowmobile use is occurring, alternatives 1a and 1b would improve air quality in the parks more than the other alternatives." SEIS, Volume I, at x. After full implementation, emissions rates of carbon monoxide ("CO"), particulate matter 10 ("PM<sub>10</sub>"), and hydrocarbons ("HC")

<sup>25</sup> Most survey respondents felt that natural quiet and solitude was important to the quality of their park visit. SEIS, Chapter IV, at 257. A recent study indicates that respondents ranked experiencing tranquility, peace, quiet, and getting away from crowds as highly important. *Id.*

<sup>26</sup> Clean air is important to most visitors. SEIS, Chapter IV, at 258. *See also*, Section IV, *infra*.

<sup>27</sup> SEIS, Chapter IV, at 261-272; *See also* Sections IV and V, *infra*.

<sup>28</sup> FEIS, Chapter I, at 25.

<sup>29</sup> *Id.* The effect of hydrocarbons, carbon monoxide, and particulates emitted by snowmobiles on water quality was also a concern.

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would all be reduced—not only below current levels, but under either Alternative 1a or 1b, CO, PM<sub>10</sub>, Nitrogen Oxide ("NO<sub>x</sub>"), and HC would all be well below the levels that would be emitted under either Alternatives 2 or 3.

Under current conditions, the total emissions in tons per year (tpy) are the following: CO=1,538 tpy; PM<sub>10</sub>= 11 tpy; NO<sub>x</sub>=19 tpy; and HC=476 tpy.<sup>30</sup> Upon full implementation of either Alternatives 1a or 1b, the parkwide total emissions will be dramatically reduced as follows: CO will be reduced by 1059 tpy (to 479 tpy); PM<sub>10</sub> will be reduced by 18 tpy (to 1.0 tpy); NO<sub>x</sub> will remain the same at 19.0 tpy; and HC will be reduced by 413 tpy (to 63 tpy).<sup>31</sup>

In comparison, under Alternative 2, CO will only be reduced by 127 tpy (to 1411 tpy), PM<sub>10</sub> will be reduced by only one (1) tpy (to 10 tpy), **NO<sub>x</sub> will actually increase by 20 tpy** (to 39 tpy), and HC will decrease by only 48 tpy (to 428 tpy). The resulting air quality after full implementation of Alternative 3 while in some ways slightly better than Alternative 2, it is worse than Alternative 2 in other ways: CO will decrease by 844 tpy (to 694 tpy), PM<sub>10</sub> will decrease by 10 tpy (to 1 tpy), **but NO<sub>x</sub> will increase by 65 tpy (to 84 tpy)**, and HC will decrease by 396 tpy (to 80 tpy).<sup>32</sup>

Alternatives 2 or 3 would only have "moderate" beneficial impacts on air quality.<sup>33</sup> In the end, it is obvious (and as the SEIS concludes), Alternatives 1a or 1b will have "major" beneficial impacts on air quality.<sup>34</sup> Furthermore, EPA Region 8 ("EPA") has concluded, only Alternative 1a will not be likely to result in noncompliance with air quality standards.<sup>35</sup> EPA has determined that Alternatives 1b, 2 and 3 would likely result in noncompliance with air quality standards and that air quality could negatively impact human health. EPA goes on to conclude that alternatives 2 and 3 are likely to be inconsistent with NPS environmental policy regarding protection of air quality and

<sup>30</sup> SEIS, Volume I, Table S-2; *See also*, SEIS, Chapter IV, Table 73, at 203.

<sup>31</sup> *Id.* More specifically, upon full implementation of either Alternatives 1a or 1b, West Yellowstone would see a reduction of CO by 86% from current levels (from 32.2 ppm to 4.5 ppm); the West Entrance to Madison would see a reduction of CO by 92% (from 14.8 ppm to 1.15 ppm). For PM<sub>10</sub>, under Alternatives 1a or 1b, West Yellowstone would see a reduction of PM<sub>10</sub> by 66% (from 68.2 to 23.4 µgrams/m<sup>3</sup>); the West Entrance to Madison would see a reduction of PM<sub>10</sub> by 84% (from 33.7 to 5.4 µgrams/m<sup>3</sup>). SEIS, Volume IV, Table 38, at 171.

<sup>32</sup> SEIS, Volume I, Table S-2. The difference between Alternatives 2 and 3 in the area of air emissions can be explained by a steeper reduction in numbers of snowmobiles under Alternative 3 than under Alternative 2, however, whereas Alternative 2 imposes numeric emission standards, Alternative 3 imposes interim emission requirements based on Best Available Technology. *See* SEIS, Table 9.

<sup>33</sup> SEIS, Volume IV, at 205. A "moderate" beneficial impact is an impact that is "sufficient to cause a change in exposure, but remains localized." *Id.*, at 204.

<sup>34</sup> SEIS, Volume IV, at 205. A "major" beneficial impact is an impact that is "substantial and highly noticeable." *Id.*, at 204.

<sup>35</sup> Letter of April 23, 2002, from Max H. Dodson, Assistant Regional Administrator for Ecosystems Protection and Remediation, EPA Region 8 to Steven F. Iobst, Assistant Superintendent, Grand Teton National Park, at 3.



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related values.<sup>36</sup> With the lowest emissions of CO, PM<sub>10</sub>, NO<sub>x</sub> and HC, Alternative 1a would result in the best possible air quality in the Parks while still providing motorized access.<sup>37</sup>

V. The Negative Impact that Snowmobiles and Snowplanes Have on the Natural Soundscape Warrants the Selection of Alternative 1a.

Not only will air quality be improved to the greatest extent and in the most expeditious manner by the selection of Alternative 1a, but there will also be major positive effects on the natural soundscape—both in degree and in the size of the sections of the park that won't be subjected to audible noise—despite the use of “quieter” equipment under Alternatives 2 and 3.

Overall, under Alternatives 1a and 1b natural soundscapes will be present over more acres, a greater percentage of time. For example, under SEIS Alternatives 1a and 1b, the average noise levels will not exceed 50 dB at 100 feet, on any road segment.<sup>38</sup> In addition, under either of these alternatives, there will be a reduction of acreage in which noise is audible more than 10% of the time. Under current conditions, noise is audible more than 10% of the time on 107,400 acres. Under Alternatives 1a and 1b, noise will be audible more than 10% of the time on only 95,060 acres – a reduction of 11% from current conditions. The results are even more dramatic when one looks at the reduction in acreage in which noise is audible more than 50% of the time. Under current conditions, noise is audible more than 50% of the time on 26,500 acres. Under Alternatives 1a and 1b, noise will be audible more than 50% of the time on only 14,090 acres – a reduction of 47% from current conditions!<sup>39</sup>

What is astonishing, however, are the results under Alternatives 2 and 3 – both of which will limit the number of snowmobiles, limit the areas for which snowmobiles will have access, limit the hours under which snowmobiles can operate, and will utilize modern technology to run “quieter” snowmobiles. Under Alternative 3, the average noise levels exceeding 50 dB at 100 feet, is found at any point along 134 miles of groomed road in the Parks.<sup>40</sup> In addition, under Alternative 3, noise will be audible more than 10% of the time on 115,030 acres – an increase of 7% from current conditions. Again, the results are even more dramatic when one looks at the increase in acreage in which noise is audible more than 50% of the time. Under current conditions, noise is audible more than 50% of the time on 26,500 acres. Under Alternative 3, noise will be audible

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> SEIS, Chapter IV, Table 77, at 220. The highest level under Alternatives 1a and 1b would be 49 dB from oversnow use of snowcoaches from the West Entrance of YNP to Old Faithful.

<sup>39</sup> *Id.*

<sup>40</sup> *Id.* The average noise levels are highest again from the West Entrance of YNP to Old Faithful, where average levels are at 54-55dB.

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more than 50% of the time on 36,270 acres – an increase of 37% from current conditions.<sup>41</sup>

However, the impact on natural soundscapes is still more dramatic when one looks at the projected results under Alternative 2. Under Alternative 2, average noise levels exceeding 50 dB at 100 feet, is found at any point along 172 miles of groomed road.<sup>42</sup> In addition, under Alternative 2, noise will be audible more than 10% of the time on 124,770 acres – an increase of 16% from current conditions. However, the results are staggering when one looks at the increase in acreage in which noise is audible more than 50% of the time. Again, under current conditions, noise is audible more than 50% of the time on 26,500 acres. Under Alternative 2, noise will be audible more than 50% of the time on 53,090 acres – an increase of 100% from current conditions!<sup>43</sup>

In summary, the acreage on which sound is audible more than 50% of the time is 18 times greater in Alternative 2 than in Alternatives 1a and 1b, and almost 11 times greater in Alternative 3.<sup>44</sup> Overall, the average sound levels are significantly lower for Alternatives 1a and 1b at 100 feet as compared to Alternatives 2 and 3 for the YNP road segments where the snowmobiles would be replaced by snowcoaches.<sup>45</sup> Further, the acres affected in Alternatives 2 and 3 are substantially higher than in Alternatives 1a and 1b.<sup>46</sup> By this measure, Alternatives 1a and 1b have the least impact on areas in which noise is expected, thereby affecting the natural soundscape the least by a substantial margin.<sup>47</sup> In light of the fact that Alternative 1a expeditiously causes this important change on the soundscape, thereby positively enhancing visitors' winter use experiences in the Parks and removing this impairment to park resources in the shortest possible time, the NPS should implement Alternative 1a.

VI. No New Information Contained in the SEIS Warrants Selection of Any Alternative Other Than Alternative 1a.

One of the principal claims by the business communities and park concessioners in the “gateway communities” surround the Parks is that the elimination of snowmobiles in the Parks will cause a devastating economic hardship on those who rely on the income from snowmobile rentals and sales.<sup>48</sup> Furthermore, such interests claim that

<sup>41</sup> *Id.*

<sup>42</sup> *Id.* The average noise levels are highest again from the West Entrance of YNP to Old Faithful, where average levels are at 55-56dB.

<sup>43</sup> *Id.*

<sup>44</sup> SEIS, Chapter IV, at 250.

<sup>45</sup> *Id.* “The DEIS demonstrates convincingly that snowcoaches are the least-impacting form of visitor transportation in frequency, magnitude, and duration of noise impacts.” See EPA Region 8 Detailed Comments on Winter Use DSEIS, April 23, 2002, at 8.

<sup>46</sup> SEIS, Chapter IV, at 251.

<sup>47</sup> *Id.*

<sup>48</sup> ROD, Attachment B, Summary of Public Comments to FEIS, at B-9-B-10.

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"snowcoaches only" is not financially feasible<sup>49</sup> and that the economic analysis presented in the FEIS was superficial and inadequate.<sup>50</sup>

The fact of the matter is that the social and economic impacts related to the elimination of most snowmobile use in the Parks was thoroughly considered by the NPS prior to selecting the chosen remedy in the FEIS and publishing the ROD. The NPS concluded that the negative economic impacts to snowmobile vendors could be mitigated to a high degree by providing oversnow access using mass transit snowcoaches.<sup>51</sup> As set forth in the ROD, considering the economic impacts, three years was found to be an appropriate period of time to allow for conversion to an NPS managed snowcoach system, in which snowmobile operators could take advantage of the existing technology for snowcoaches, and to realize the investment that they had previously made in snowmobiles.<sup>52</sup>

While it is likely that these same parties will make similar arguments in support of Alternatives 2 and 3 contained within the SEIS, the data remains abundantly clear that any socioeconomic effects that there would be no measurable effect on any of the gateway communities.<sup>53</sup> While the decrease or loss of snowmobiling opportunities in the parks readily equates to an "adverse economic impact," these impacts "are not considered irreversible or long term in the context of the total economy."<sup>54</sup> In fact, in all four SEIS alternatives, the estimated output and economic impact for the 5-county and 3-state analysis areas are less than one-half of one percent of baseline levels.<sup>55</sup>

Therefore, despite claims by businesses in the gateway communities that banning snowmobiles will have an irreversible, permanent, and dramatic negative impact on the local economy, the evidence to date does not support such claims and in fact, contradicts them.

#### VII. Conclusion

For the second time in 3 years, the NPS is being asked to review the Winter Use Plans for Yellowstone and Grand Teton Nation Parks and the John D. Rockefeller, Jr. Memorial Parkway. After over a decade of study, in 2000, the NPS issued a comprehensive and complete ROD which, upon implementation, was to ban all recreational snowmobile use in the Parks. Despite this complete and thorough study, the NPS is once again, reviewing the issue. It is clear based on the evidence in the FEIS record, the ROD, and the SEIS record, that no new information persuasively proves that

<sup>49</sup> *Id.*

<sup>50</sup> ROD, Attachment B, Summary of Public Comments to FEIS, at B-11.

<sup>51</sup> ROD, at 19.

<sup>52</sup> ROD, at 21.

<sup>53</sup> SEIS, Volume 1, at x.

<sup>54</sup> SEIS, Chapter IV, at 285-286.

<sup>55</sup> SEIS, Chapter IV, at 146. This is consistent with the results found for the FEIS alternatives. *Id.*

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the NPS was incorrect in their 2000 decision. The expeditious removal of snowmobiles is mandated under all applicable legal authority; it is clearly based on all scientific information collected to date; and it is overwhelming recommended by the majority of visitors and experts who have reviewed the data (including a recent review by EPA Region 8). Therefore, on behalf the members of Rock the Earth, we strongly register our position that the NPS, once again, adopt the alternative that removes this impairment to the Parks in as expeditious of manner by selecting and implementing Alternative 1a.

Thank you for your consideration.

Sincerely,



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May 29, 2002

**BY ELECTRONIC AND OVERNIGHT MAIL**

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
P.O. Box 352  
Moose, WY 83012

To Whom it May Concern:

On behalf of the more than 7.5 million members and supporters of The Fund for Animals, The Humane Society of the United States, Biodiversity Legal Foundation, and Ecology Center, I submit the following comments on the Draft Supplemental Environmental Impact Statement (SEIS) on winter use management in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway (hereafter referred to as "the parks" or individually as YNP, GTNP, and JDRMP).

For the record, my clients do not support any of the alternatives evaluated in the SEIS. While Alternative 1A is my clients' preferred alternative of those evaluated in the SEIS, the National Park Service's (NPS) failure to comprehensively evaluate a no-oversnow motorized access,<sup>1</sup> no-road packing/grooming alternative prevents my clients from fully supporting any alternative. Indeed, the only alternative that my clients can embrace, and the only alternative that is fully consistent with the legal mandates of the NPS, is a no-oversnow motorized access, no-

<sup>1</sup>Oversnow motorized access includes both snowmobile and snowcoach access to the parks. My clients are not, per se, opposed to the operation of snowcoaches as a mode of mass-transit transportation, but snowcoaches can only operate in the parks if their access is facilitated through the packing/grooming of snow covered roads. The direct, indirect, and cumulative impacts of road packing/grooming are significant, adverse, and have led to artificial and unnatural conditions affecting a number of wildlife species and park ecology in violation of the NPS Organic Act, regulations, and policies.

road packing/grooming alternative.<sup>2</sup>

Alternative 1A represents a step in the right direction but it doesn't meet the preservation mandate of the NPS. Alternative 1A, when implemented, would result in the immediate phase out of snowmobile use in the parks as called for in the 2001 Record of Decision and the final rule amending snowmobile regulations in the parks. 66 FR 7259. Such an alternative would benefit the parks by reducing adverse impacts to wildlife, air and water quality, natural quiet, and to park visitors who enjoy non-motorized forms of recreation. Therefore, though Alternative 1A does not meet the basic legal mandate of the NPS to preserve nature as it exists, the NPS must, at a minimum, select Alternative 1A since it cannot provide, based on the evidence presented in the SEIS supporting Alternative 2 and 3, a "reasoned analysis" for changing its 2001 decision. Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co., 463 U.S. 29, 42.

The selection of Alternative 1A, while far better than any of the other alternatives evaluated in the SEIS, will not shield the NPS from litigation due to its failure to consider a no-oversnow motorized access, no-road packing/grooming alternative. Alternatives 1B, 2, and 3 cannot be selected since these alternatives would permit an impairment of park wildlife, resources, and values to continue in violation of the NPS Organic Act, corresponding regulations, and NPS policies.

While the evidence does not exist to reverse the 2001 decision, there is substantial and compelling legal and scientific evidence to justify the selection of a no-oversnow motorized access, no-road packing/grooming alternative to protect and preserve park wildlife, resources, and values as intended by Congress and required by federal laws. The failure of the NPS to seriously consider such an alternative is particularly egregious considering the requirements of the National Environmental Policy Act (NEPA), NPS policies, my clients' repeated requests that such an alternative be evaluated (Enclosures 1, 2, and 3), and previous agreements and commitments made by the NPS and subsequently ignored. To make matters worse, the NPS continues to rely on a biological assessment and opinion that failed to consider the direct, indirect, and cumulative impacts of road packing/grooming on federally listed threatened and endangered species in violation of the Endangered Species Act. Until and unless the NPS comprehensively evaluates a no-oversnow motorized access, no-road packing/grooming alternative, it will be in violation of the NEPA for failing to include a reasonable range of alternatives and of multiple federal laws, NPS regulations and policies, and other legally binding documents for failing to consider what is an obvious winter use management alternative.

<sup>2</sup>While such an alternative would provide maximum benefits to the parks and their ecological integrity, wildlife, resources, values, and be fully consistent with existing legal standards, a complete cessation of all oversnow motorized access to the parks is not necessary to provide substantial benefits. The Natural Regulation Alternative, developed by The Fund for Animals in response to the Draft Environmental Impact Statement on winter use management, provides for limited oversnow motorized access to YNP and, if implemented, would be acceptable to my clients.

As a result of this incomplete analysis in the SEIS of the environmental impacts of winter use issues, my clients are placed in an unusual position. On the one hand, the SEIS provides substantial evidence supporting an immediate phase-out of snowmobiles from the parks as articulated in Alternative 1A. However, on the other hand, neither the SEIS nor previous environmental documents provide any evaluation of a no-oversnow motorized access, no road-grooming/packing alternative. Indeed, the NPS has yet to provide a rational explanation as to why it must permit oversnow motorized access of any kind to the parks, has failed to demonstrate that such activities will not impair or disturb park wildlife and other park values, and has consistently ignored compelling scientific evidence demonstrating the significant direct, indirect, and cumulative impacts of road packing on bison, grizzly bears, and other park wildlife. If the NPS is committed to preserving natural conditions, to allowing natural regulation to drive park management, and to meeting its preservation mandate -- all of which it is legally bound to do -- it cannot pick and choose when such standards are acceptable (i.e., closing garbage dumps being used by bears) and when they are not (i.e., road packing/grooming to facilitate snowmobile and/or snowcoach access). Furthermore, although the entire basis for the SEIS process is due to political promises by the Bush administration, the NPS is required to manage the parks as specified by law, not by politics.

These comments will, therefore: 1) document the failure of the NPS to properly consider a no-oversnow motorized access, no-road packing/grooming alternative as required by federal law; 2) discuss and evaluate the evidence supporting, at a minimum, the selection of Alternative 1A; and 3) provide specific comments on the evidence and analysis contained in the SEIS. First, however, a summary of the relevant background information, legal agreements, and previous NPS decisions is warranted.

#### **BACKGROUND:**

For over five years, since the settlement agreement was reached in 1997, the NPS has attempted to evaluate the myriad impacts associated with winter use and management of the parks. While these analyses have provided an abundance of information, the NPS continues to ignore the law and to avoid comprehensively evaluating all aspects of this issue, particularly the impact of road packing/grooming on wildlife.<sup>3</sup> This failure is largely a product of the NPS believing, without any explanation, that it must provide oversnow motorized access to the parks. Indeed, not only is there nothing mandating that snowmobiles or snowcoaches be allowed access to the parks in the winter, but the NPS has blatantly failed to prove that such use does not impair or disturb park wildlife. Indeed, considering the inadequacies contained in the FEIS and SEIS.

<sup>3</sup>Amazingly, for most of the 35 years of snowmobiles abusing Yellowstone, the NPS has been violating its own regulation by packing/grooming the road surface to facilitate such use. Until publication of its final rule on January 22, 2001, road packing/grooming was not permitted as a means to delineate the boundaries of a designated snowmobile route. When The Fund advised the NPS that it was not authorized to pack/groom the road surface, it amended its own regulations to permit packing/grooming.

the NPS continues its over 35-year experiment of allowing oversnow motorized access of the parks without ever properly evaluating the environmental impacts of such use as required by NEPA, the ESA, and other federal laws. The experiment must now end.

To avoid addressing the road packing/grooming issue the NPS has made and broken a series of agreements and promises intended to properly study and evaluate this matter. Instead, it has relied on an over-used government strategy of claiming more study/monitoring is needed before action can be taken.

For instance, in the settlement agreement in *The Fund for Animals v. Babbitt*, the NPS agreed to prepare a comprehensive Environmental Impact Statement "addressing a full range of alternatives for all types of winter visitor use, including snowmobiling and trail grooming, in the Parks and considering the effects of those alternatives on the Park's environments." Settlement at 1.<sup>4</sup> In addition, to permit the collection of additional data needed to prepare the DEIS, the NPS explicitly committed to studying the impacts of groomed snowmobile trails on bison, *id.* at 6, by proposing to close the Hayden Valley segment of the Yellowstone packed road system during the winter of 1998-1999 as well as 14 miles each winter thereafter while the EIS is being prepared. *Id.* In negotiating this agreement, NPS and Department of Justice officials acknowledged that data on bison use of unpacked/ungroomed roads was critical for the proper evaluation of this issue in the DEIS.

The critical nature of this data is also reflected in the Draft Environmental Assessment on Temporary Road Closures in which the NPS states, "a winter road closure would provide useful information to researchers attempting to understand if a link between the groomed roads and wildlife movement exists." Absent such closures, the NPS concluded that it "would not be able to comparatively assess the effects of groomed winter roads on wildlife." What was a critical need for data (on bison use of unpacked/ungroomed roads) quickly became an afterthought in response to political interference and pressure as the NPS reversed its proposal and decided, without any rational explanation, that it would continue grooming the entire Yellowstone road/trail system all three winter seasons. Finding of No Significant Impact on the Temporary Road Closure EA. The NPS claimed that "the question about wildlife use of groomed roads and possible adverse effects needs more detailed monitoring, research, and analysis." *id.*, and that only after the EIS is completed would the agency consider trail closures for the purposes of gathering additional data. *Id.* This about-face in NPS thinking began to demonstrate the NPS's true intentions to avoid any serious analysis of this issue. While The Fund failed in attempting to overturn the NPS decision, the court did not question the legitimacy of The Fund's claim, but only questioned when such a claim should be argued.

<sup>4</sup>The settlement agreement also required the NPS to annually solicit public comments on potential road closures and other studies to be done during the winter. This turned out to be largely a make work exercise as the NPS consistently ignored public comments, including those submitted by one or more of my clients. It is also unknown if the NPS consulted with experts, including Dr. Mary Meagher, as required by the settlement agreement.

Despite claiming that a decision about road closures would be made after the FEIS was completed, the NPS made no affirmative decision to close one or more roads to collect the data on bison use of unpacked/ungroomed roads that the NPS claimed was critical. Instead, it elected to continue to monitor bison use of packed/groomed roads and to collect additional "baseline" data on such use. Only if it was determined through such monitoring that wildlife use of packed/groomed roads was resulting in adverse impacts, and only after a year's notice, could a road be closed. ROD at 3. Not surprisingly, the NPS has never had to exercise this option as it has consistently ignored the evidence presented by my clients, Dr. Mary Meagher, and other scientists documenting the adverse impacts to bison and other wildlife associated with wildlife use of packed/groomed roads. Instead, it has embraced the results of a study conducted by Bjornlie (2000, 2001) and YNP scientists (Kurz et al. 2000, Reinertson et al. 2001) which held that bison use of the packed/groomed roads as travel routes is relatively infrequent. What the NPS fails to recognize or admit is that these studies contain serious flaws and deficiencies which call into question the legitimacy of the study results and conclusions. Indeed, in their review of the study protocol used by Bjornlie and Garrott (a protocol that is similar to that currently used by the NPS), Drs. Messier and Gasaway stated that even after completion of the study "there still will be little knowledge on the influence of groomed roads on bison population dynamics and range use," and that "the interpretation of results in terms of significance to the population will be subjective and the controversy will remain." Studies of Bison Ecology and Brucellosis in the Greater Yellowstone Ecosystem: An Independent Review. The NPS has ignored such findings and flaws perhaps hoping that these studies would make the road packing/grooming controversy disappear. Even now, after five years of collecting "baseline" data, the NPS continues to delay a decision on road closures by, yet again, proposing to monitor and collect data on bison use of packed/groomed roads. SEIS at 21.

The Fund reluctantly agreed to the settlement in 1997, setting aside its concern for the fate of Yellowstone's bison based on the commitment of the NPS to collect data to fully evaluate the road packing/grooming issue in the DEIS. The Fund, unlike the NPS, entered into the agreement in good faith with the understanding that the NPS would follow through with its commitments. While The Fund generally agreed with the NPS assertions that it needed data on bison use of groomed and ungroomed areas for evaluation in the DEIS, The Fund repeatedly made it clear that a substantial amount of data on the direct, indirect, and cumulative impacts of bison use of the packed/groomed roads on bison movements, distribution, habitat use, population dynamics, other wildlife species, and park ecology was already available in the form of over 30 years of data collected by Dr. Mary Meagher. The NPS has, inexplicably, largely ignored Dr. Meagher's data and findings, including her more recent reports and analyses. Since the NPS can't claim that it is unaware of such information, the NPS decision to ignore this evidence -- evidence that it was required to evaluate in the SEIS -- is likely due to the data/evidence presented by Dr. Meagher and other scientists demonstrating bison use of the packed/groomed roads have substantially and adversely impacted bison and other wildlife, has caused disturbance, and constitutes an impairment to park wildlife.

While such decisions were made, data ignored, and legal challenges argued, Yellowstone's

bison continued to use the packed roads as energy efficient travel pathways facilitating their movements both within and outside of Yellowstone National Park. While Bjornlie (2000, 2001), Bjornlie and Garrott (1998), Kurz et al. (2000), and Reinertson et al. (2001) continued to downplay the importance of the packed roads for wandering bison, anecdotal reports of bison use of the packed roads were routinely reported in hundreds of media stories, documented by YNP visitors, and noted in detailed records compiled by YNP rangers. For those bison choosing to wander west, their use of the packed roads represented a death march as most have been killed as a consequence of a scientifically flawed, unethical, enormously expensive, and publicly unacceptable bison management plan implemented by the NPS, Montana, and other agencies.<sup>5</sup> Additional study of bison use of packed/groomed roads without actually closing the trails to grooming -- as the NPS continues to promote -- will only result in more dead bison, increased disturbance and impairment of bison and other wildlife, impairment of other park resources and values, further degradation of the fragile yet critically important geothermal areas, exacerbate the decline in the ecological integrity of Yellowstone, and will allow the NPS to continue to avoid meeting its legal mandate to preserve natural conditions.

The SEIS provided the NPS yet another opportunity to fully disclose and evaluate the impacts of the packed/groomed road system on bison. For whatever reasons (i.e., the irrelevant economic claims of the gateway communities, the fuming of snowmobilers and snowmobile manufacturers, or the rhetoric of local, state, and federal politicians), the NPS has elected to continue to ignore the issue and, by doing so, to continue to violate its statutes, regulations, and policies. Thus, if the NPS intends to comply with its legal mandates it must prohibit oversnow motorized access and road packing/grooming in the parks. Alternatively, at a minimum, the NPS must prohibit such activities for at least 5 years and use that time to collect data on bison use of unpacked/ungroomed roads -- data that even the NPS asserts is critical to fully understand the biological and ecological implications of the packed/groomed road system to wildlife. To do otherwise and to continue to permit road packing/grooming, snowmobiling, and/or snowcoach operations in the parks is unacceptable and will force my clients to consider all options to reverse such an outcome.

#### **DEFICIENCIES IN THE SEIS ANALYSIS:**

- I. The NPS Must Adopt a No-Snowmobiling, No-Road Grooming/Packing Alternative in Order to Comply with Federal Statutes, Regulations, Policies, Executive Orders, and the Scientific Evidence:

Much of the information and evidence discussed herein have been previously disclosed in numerous reports, comments, and other documents submitted to the NPS on this subject. While some repetition will be necessary to emphasize certain key points, just as the NPS has frequently referred to the analysis in the FEIS to avoid repetition in the SEIS, I will do the same by

<sup>5</sup>Over 3,300 bison have been killed outside of YNP since 1985, including 200 killed during the winter of 2001-2002.

frequently referring to documents which are already part of the record for this issue. The NPS, in evaluating this comment letter, must reexamine these referenced documents. To ensure that no document is overlooked and to guarantee that the record is complete, I hereby incorporate by reference and attach each of the referenced documents (see Enclosures 1-7).<sup>6</sup>

Congress created Yellowstone in 1872 as a "public park or pleasuring ground for the benefit and enjoyment of the people." 16 U.S.C. §21 (See Enclosures 1, 2, 4, and 5 for a more detailed discussion of the statutes, legislative history, and historical documents delineating the management mandates of the NPS). While some have used this language to claim that public use should be the predominant objective of the NPS in its management of Yellowstone, nothing could be further from the truth. Congress made this perfectly clear when, in establishing Yellowstone, it instructed that the park be maintained for "the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders, within the park, and their retention in their natural condition." 16 U.S.C. §21-22. This is the first, but certainly not the last Congressional directive that created the preservation mandate of the NPS.

Some 44 years after the establishment of Yellowstone, Congress created the NPS to administer units of the National Park System. In creating the NPS, Congress instructed it to administer the parks as necessary to further the parks' "fundamental purpose," by doing whatever is necessary to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 16 U.S.C. §1. Far from creating a dual mandate as suggested by many, the Organic Act clearly established the preservation of nature in an unimpaired state as the primary directive of the NPS while public use of the parks, although encouraged, was to be subservient to nature preservation. Thus, in designating hundreds of NPS units since that time, including GTNP and JDRMP, Congress has repeatedly reaffirmed its

<sup>6</sup>The following documents are attached to this comment letter as Enclosures 1-7. Enclosure 1 -- December 15, 1999 comments of The Fund for Animals and Biodiversity Legal Foundation on the DEIS; Enclosure 2 -- \_\_\_\_\_ comments of The Fund for Animals and Biodiversity Legal Foundation on the FEIS; Enclosure 3 -- \_\_\_\_\_ letter to the NPS documenting need for no-oversnow motorized access, no-road packing grooming alternative in the SEIS; Enclosure 4 -- February 1997 report "Adverse Effects of Trail Grooming and Snowmobile Use on Winter Use Management in The Greater Yellowstone Area with a Special Emphasis on Yellowstone National Park;" Enclosure 5 -- January 1999 Petition to Prohibit Snowmobiling and Road Grooming in National Parks prepared by Bluewater Network, Meyer & Glitzenstein, and Schubert & Associates; Enclosure 6 -- "Recent Changes in Population Distribution: the Pelican Bison and the Domino Effect," manuscript prepared by Meagher et al. for YNP science workshop held in October 2001; Enclosure 7 -- Taper et al., 2000. "The Phenology of Space: Spatial Aspects of Bison Density Dependence in Yellowstone National Park."

<sup>7</sup>Furthermore, Yellowstone's own planning documents provide additional support for the preservation of natural conditions. See Enclosure 4, footnote 37.

intention that, while these areas should be available for appropriate public use, they must be protected from despoliation in order to preserve "nature as it exists." See H. Rep. No. 700, 64th Cong., 1st Sess 3 (1916).<sup>8</sup> In 1970, Congress reaffirmed its commitment to protecting national parks by instructing the NPS not to administer the parks "in derogation of the values and purposes for which these various areas have been established..." and that activities "in derogation of park values could be allowed only if authorized by a park area's enabling legislation or other applicable federal law." *Michigan United Conservation Clubs v. Lujan*, 949 F. 2d 202, 205 (6th Cir. 1991).

The statutes, legislative history, case law, and the NPS's own historical documents provide indisputable evidence that the national parks were intended to be unique and subject to a management paradigm unlike any other federal lands. While "multiple-use" is the dominant management emphasis on U.S. Forest Service lands, grazing predominates on Bureau of Land Management administered public lands, and hunting has unfortunately become common on national wildlife refuges, the national parks are to be managed to preserve nature as it exists, to preserve the parks in their natural state, to retain park wildlife and resources in their natural condition, and to prevent impairment of park wildlife, resources, and values for the benefit and enjoyment of future generations. The statutory standard is simple, the parks must be managed to protect and preserve nature in her natural condition and to eliminate any activity that will result in or is causing impairment. Admittedly, both in the past and present, the NPS continues to permit certain activities in certain parks that violate its own statutory mandates, but today the NPS is closer to recognizing and respecting its mandate than it has been in the past. Recognition of a mandate and implementation of management actions consistent with that mandate are, however, different. It is in the implementation phase where the NPS continues to err in favor of permitting public use of national parks despite the impairment, degradation, and disturbance inherent to such use. Snowmobiling, snowcoach operation, and road-packing/grooming are examples of where NPS actions are not consistent with NPS mandates.

In the early 1970's, shortly after snowmobiles began to invade Yellowstone during winter and in response to a significant proliferation of off-road vehicles use on federal lands generally, President Nixon issued Executive Order 11644 to provide federal agencies with additional guidelines to eliminate, prevent, and minimize the impacts of such use. This EO is relevant to the use and management of snowmobiles in the parks and was one of the myriad factors that led to

<sup>8</sup>Historical NPS documents also reaffirm "nature preservation" as the preeminent duty of the NPS. In a May 13, 1919 letter from Interior Secretary Franklin Lane to NPS Director Stephen Mather, Mr. Lane states that "every activity of the Service is subordinate to the duties imposed upon it to faithfully preserve the parks for posterity in essentially their natural state." (Dilsaver 1994). Similarly, in 1925, the Interior Secretary stated that "the duty imposed upon the National Park Service in the Organic Act creating it (was) to faithfully preserve the parks and monuments for posterity in essentially their natural state is paramount to every other activity." See *National Rifle Ass'n v. Potter*, 628 F. Supp. 903, 910 (D.D.C. 1986).

the NPS decision to phase-out snowmobile use of the parks in 2001.<sup>9</sup> EO 11644, as amended by EO 11989, specifies that within the national park system, off-road vehicle "routes and areas may be designated only in locations in which there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values, and in consideration of other visitor uses." Policy at 8.2.3.1. When snowmobile use "is causing, or will cause, unacceptable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources," the EO requires that the superintendent must immediately close the route or area. *Id.* The EO, however, is a supplement to, not a replacement of, federal law, regulations, or NPS policies. Thus, the "adverse impacts" and "unacceptable adverse effects" standards contained in the EO are supplemental to the impairment and disturbance standards imposed by NPS statutes and regulations.

If the NPS Organic Act and the statute creating Yellowstone National Park do not provide sufficient clarity of the nature preservation and natural regulation mandates of the NPS, NPS regulations and policies surely do (see Enclosures 1, 2, 4, and 5 for additional analysis of NPS regulations). The key regulations in this debate prohibit "disturbing" living wildlife from its "natural state," 36 C.F.R. §2.1(a)(1)(I), and only permits snowmobiles if their use "is consistent with the park's natural, cultural, scenic, and aesthetic values, safety considerations, park management objectives, and will not disturb wildlife or damage park resources." 36 C.F.R. §2.18(c). Again, the standard is simple: if snowmobiles (and logically snowcoaches) disturb park wildlife, damage park resources, or are inconsistent with the natural, scenic, and aesthetic values of the parks, then the activity is impermissible (see SEIS at 119, "NPS does not have the authority to allow snowmobile use where disturbance occurs").<sup>10</sup>

The term "disturb" is not defined in the regulations or in NPS policy. The NPS defines "disturbance" in the SEIS as "to interfere with, or destroy the tranquility or composure of wildlife." SEIS at 116. It goes on to assert that "all of the effects described as associated with oversnow motorized use may be broadly referred to as disturbances -- an astonishing concession that any and all oversnow motorized use (snowmobiles and snowcoaches) represent a disturbance and, consequently, is not permitted by NPS regulation. Even without this concession, considering the substantial evidence of disturbance (and impairment) associated with snowmobiling, snowcoach operation, and road-packing/grooming summarized below, it is indisputable that such activities are causing a disturbance (and impairment) and, therefore, must be terminated.

NPS policies, newly revised and adopted in 2001, provide additional support for the NPS natural regulation mandate and the adoption of a no-oversnow motorized access, no-road packing/grooming alternative. As these policies are partially summarized in the SEIS at 8-12.

<sup>9</sup>The EPA also concluded that "current snowmobile use is indeed adversely affecting the natural (wildlife, air quality), aesthetic (noise), and scenic (visibility) values in these Parks," in violation of EO 11644, as amended. EPA comments on the DEIS (undated).

<sup>10</sup>This standard would also apply to snowcoach operations if -- as is the case -- such operations cause the disturbance of park wildlife.

there is no need to restate these policies here. A sampling of those policies that clearly support the preservation of nature as the NPS's primary mandate is warranted as it sets the stage for additional comments and conclusions made in this letter.

According to NPS policy, "the fundamental purpose of the national park system ... begins with the mandate to conserve park resources and values." Policy at 1.4.3. This mandate is separate from the impairment standard and, therefore, applies all the time to all park resources and values, even when there is no risk of impairment. The NPS "must always seek to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values." *Id.* Impacts can be permitted to park resources but only "so long as the impact does not constitute impairment of the affected resources and values." *Id.* While providing for public use of the parks is also characterized as a fundamental purpose, when there is a conflict between conserving resources and values and providing for their enjoyment, "conservation is to be predominant." Policy at 1.4.3. The courts have consistently agreed with this policy by concluding that the NPS has "a conservation mandate," "an overriding preservation mandate," "a primary mission of resource conservation," or must make "resource protection the primary goal" or its "overarching concern." *Id.*

Park resources and values subject to the nonimpairment standard include:

- \* The park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells, water and air resources; soils, geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- \* Opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing any of them;
- \* The park's role in contributing to the national dignity, the high public value and integrity and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- \* Any additional attributes encompassed by the specific values and purposes for which it was established. Policy at 1.4.6.

NPS policy specifies that the impairment standard is the "cornerstone of the Organic Act." Policy at 1.4.4. "It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of

them.” *Id.* An impairment can only be permitted if “directly and specifically provided for by legislation or by the proclamation establishing the park.” *Id.* If a proposed action will cause an impairment, “the action may not be approved.” Policy at 1.4.7. If an on-going action is causing an impairment, the NPS must “eliminate the impairment ... as soon as reasonably possible, taking into consideration the nature, duration, magnitude, and other characteristics of the impacts to park resources and values...” *Id.* An impairment is defined as an impact that “would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.” Policy at 1.4.5. Whether an impact satisfies this definition depends on “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.” *Id.*

In addition to these general policies, other NPS policies are specific to resources, values, and uses protected and/or under the administration of the NPS. For example, while the Clean Air Act requires the protection of air quality related values in Class I areas, NPS policies specify that the NPS will perpetuate the best possible air quality to 1) preserve natural resources and systems; 2) preserve cultural resources; and 3) sustain visitor enjoyment, human health, and scenic vistas. Policy at 4.7.1. Vegetation, visibility, wildlife, and water quality are just some of the park elements sensitive to air pollution and are referred to as air quality-related values by the NPS. *Id.* When there is some doubt as to the impacts of existing or potential air pollution on park resources, the NPS must err on the side of protecting air quality and related values for future generations. *Id.*

In addition to protecting air quality, NPS policies also apply to protecting the natural soundscapes. The NPS must “restore degraded soundscapes to the natural condition wherever possible, and must protect natural soundscapes from degradation due to noise (undesirable human-caused sound).” Policy at 4.9. Furthermore, the NPS must “take action to prevent or minimize all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor uses at the sites being monitored.” *Id.*

While visitor use of the parks is considered a fundamental purpose of the parks (yet secondary to the conservation mandate), recreational opportunities are only permitted if they are “uniquely suited and appropriate to the superlative natural and cultural resources found in the parks,” “are appropriate to the purposes for which the park was established,” “are inspirational, educational, or healthful and otherwise appropriate to the park environment,” and “can be sustained without causing unacceptable impacts to park resources or values.” Policy at 8.2. Conversely, the NPS will not permit activities that “would impair park resources,” “create an unsafe or unhealthy environment for other visitors or employees,” “are contrary to (or would result in the derogation of) the purposes (and values) for which the park was established,” (see also, ROD at 14), result in “unacceptable impacts on park resources or natural processes,” (ROD at 14), or “unreasonably interfere with: the atmosphere of peace and tranquility (or) ... the natural soundscape ... in wilderness ... locations within the park.” Policy at 8.2. It is not clear if there is a

difference between “unacceptable impacts” and an impairment, but the impairment standard imposed by the NPS Organic Act and the disturbance standard imposed by NPS regulations are the applicable standards in this case.

One policy area that the NPS did not discuss in the SEIS relates to its management of natural resources. NPS natural resource management policy states that “natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities.” Policy at 4.1. The NPS “will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems,” *id.*, and will rely on “natural processes,” whenever possible, to maintain native plant and animal species, and to influence natural fluctuations in populations of these species.” Policy at 4.4.2. The NPS will achieve this goal by “preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur,” and by “minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.” Policy at 4.4.1. In the event that human activities have disturbed components of natural systems, the NPS “will re-establish natural functions and processes.” Policy at 4.1.5. Impacts on natural systems resulting from human disturbances include “the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes.” *Id.* If the NPS is to comply with the foregoing natural resource management policies then, considering the adverse impacts and implications of wildlife use of the packed road system, the NPS must prohibit road packing/grooming and terminate oversnow motorized access to the parks.

Like the relevant statutes and regulations, NPS policies provide simple standards to guide NPS management. These standards require, first and foremost, that the NPS protect and preserve park wildlife, resources, and values and prevent their degradation. Activities or management actions that violate these standards are not permitted. If the NPS intends to comply with these policies, then, considering the adverse impacts associated with snowmobiling, snowcoach operation, and road-packing/grooming in the parks, these activities must be prohibited. As there is no “wobble room” or “gray area” in interpreting the relevant statutes, regulations, and policies, the NPS can no longer make excuses, dream up bizarre interpretations, or ignore its legal mandates -- either it complies with the law or it doesn't. Either it prohibits oversnow motorized access to the park and road packing activities or it continues to capitulate to those political and business interests who only view Yellowstone as a cash cow available to exploit with virtually no concern for her wildlife, ecological integrity, or inherent value to all citizens, including those yet born.

Like the intent of the relevant statutes, regulations, and policies, the evidence supporting the significant adverse impacts, impairment, and disturbance associated with snowmobiling, snowcoach operation, and road packing/grooming is also crystal clear. Enclosures 1, 2, 4, 5, 6,



and 7 provide an exhaustive analysis of such adverse impacts to wildlife, air and water quality, vegetation, natural quiet, and park visitors who participate in non-motorized recreational activities which the NPS must consider in evaluating this comment letter. Instead of repeating this information here, the following analysis will summarize the information and discuss new evidence that has been published and/or collected since the ROD was published in 2000. The focus of this analysis will be on wildlife impacts, particularly impacts to bison and grizzly bears.<sup>11</sup>

The winter climate in the Greater Yellowstone Ecosystem poses significant threats and hardship on many wildlife species. Because of snow depths, ice, and cold temperatures, most wildlife species experience a negative energy balance in winter where energy output to survive is greater than energy input. Unnecessary or unexpected energy use in winter to avoid predation, to flee from human intrusions, and/or in response to stress associated with human recreation, can represent the difference between survival and death in wildlife. Declining energy reserves can also increase an animal's susceptibility to disease and impair reproduction.

The ability to observe Yellowstone bison using snow-packed roads is partly a product of this energy dynamic. Yellowstone's bison have altered their movements, distribution, and habitat use patterns by utilizing the park's packed road system as energy efficient travel routes. As a result bison population dynamics have been artificially and unnaturally influenced by their use of the road system which has reduced winterkill and increased survival. In other words, bison who would have died under more natural conditions (i.e., no packed roads to use as energy efficient travel routes) have survived even the harshest winters. Bison use of these hard packed road surfaces is also due to their feeding behavior, gregariousness, and the location of the road system in lower elevation habitat and, in some places, geothermally influenced habitat where snow depths are reduced.

While some, including the NPS, question the significance and implications of bison use of the packed road system, the long-term data do not lie. Bison use of the packed roads since the early 1980's has expanded bison range and completely altered bison population dynamics, movements, distribution, and habitat use patterns for the past two decades. The result has been a western shift in bison distribution, a temporal change in how and when bison use winter and

<sup>11</sup>As disclosed and discussed in Enclosures 1, 2, 4, and 5, snowmobiles and packed/groomed roads also adversely and unnaturally impact other wildlife species including elk, mule deer, moose, wolves, coyotes, subnivean wildlife, and lynx by fragmenting habitat, displacement, increased stress, altering movement and distribution patterns, changing habitat use patterns, and disrupting natural predator/prey dynamics. The impact of packed roads on species that may compete with lynx for prey is so significant (i.e., by allowing predators access to lynx-occupied areas that wouldn't be accessible without a packed road) that the U.S. Fish and Wildlife Service has required a no net increase in groomed or designated over-the-snow routes and snowmobile play areas within lynx habitat on Federal lands. November 2001 Biological Opinion on the effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx.

summer range, and a bison population that is far larger than what would exist if Yellowstone complied with its natural regulation mandate and prohibited oversnow motorized access and road packing/grooming activities. According to Meagher et al. (1997), the bison population in 1994 was double the size it would have been if more natural conditions (i.e., no packed roads) existed in Yellowstone.

Moreover, snowmobile use in the parks disturbs wildlife, including bison, in violation of NPS regulations. As explained by the NPS in the final rule implementing the decision contained in the 2000 ROD (66 FR 7259):

The FEIS and studies referred to in it document ways in which snowmobile use in the parks disturbs wildlife. Based on the same information, we have also determined that the snowmobile use occurring in Yellowstone impairs its resources and values, including wildlife. The impacts include, in particular, the effects (of snowmobiles on bison using Yellowstone's roadways), especially from those (snowmobiles) operated inappropriately by inexperienced operators. Bison are frequently herded back and forth on the roadways, requiring unnatural energy expenditures during the time of year of greatest stress to them, from high snow, extreme cold, and food shortages.

In addition, a recent report analyzing physiological stress in wolves and elk (Creel et al. in press), found increased stress levels in wolves and elk associated with increased snowmobile traffic. SEIS at 124. While the authors found no evidence that current snowmobile use levels have resulted in population level effects for either wolves or elk, they do "disclose disturbance to individual animals from winter recreation, including displacement and behavioral responses." SEIS at 125. Similarly, Hardy (2001) found that stress levels in elk increased with increasing amounts of traffic indicating that "nonobservable (stress) responses do occur and may contribute to chronic stress," SEIS at 126, which, in turn, may "affect resistance to disease and survival and ... inhibit reproductive potential." *Id.* In response to these studies, the NPS concludes that "harassment and displacement of individuals is evident and remains a stated concern." SEIS at 126.

Bison use of snow-packed roads has allowed them to find alternative wintering sites, generally of marginal value, both inside and outside the park. While such exploratory activities have not required the energy expenditure that would have been necessary under more natural conditions, bison emigration from Yellowstone is generally a one-way trip due to the insidious, inhumane, and scientifically fraudulent anti-bison policies adopted by the agencies and enforced by the Montana Department of Livestock. Bison use of the snow-packed roads, therefore, directly and indirectly contributes to their death and removal from the ecosystem with additional implications to other species, particularly to grizzly bears.

The harassment, slaughter, and shooting of bison outside of Yellowstone provides sufficient justification for the NPS to restore a more natural management paradigm to the park. Despite the concerns of the livestock industry and the State of Montana regarding the

transmission of *Brucella abortus* from bison to cattle and ongoing claims that the problem with emigrating bison is a park problem that should be addressed in Yellowstone, the NPS has continually and consistently refused to do everything in its power to reduce the number and rate of bison emigrating into Montana. Instead, the NPS recently agreed -- relying on rather twisted logic -- to assist in harassing, shooting, and slaughtering bison outside of the park claiming that such actions would provide a conservation benefit to bison inside Yellowstone. March 1, 2002 memorandum from D. Hecox, DoI Solicitor to F. Walker, Acting Supt. YNP, re: Authority for Employees of Yellowstone National Park to Cooperate with the State of Montana in Implementing the Long-term Bison Management Plan. If the NPS intends to satisfy its conservation mandate then it must terminate road packing/grooming and prohibit oversnow motorized recreation to restore naturalness to Yellowstone.

If reducing or eliminating the alleged risk of *B. abortus* transmission from bison to cattle to protect Montana's and the nation's livestock industry or preventing the ongoing annual slaughter of Yellowstone's bison is not justification enough for prohibiting road packing and oversnow motorized recreation, perhaps saving Yellowstone's bison herd from extermination is. The reality is that, despite an increase in bison population numbers since 1996/97, (i.e., from approximately 2000 bison in 1997 to slightly more than 3000 at present) the availability of survival habitat (i.e., geothermal habitat) is declining and potentially represents a significant threat to the long-term survival and viability of Yellowstone's bison. Geothermal areas, while remarkably fragile, provide critically important habitat for bison and other wildlife during winter and, particularly, during severe winters. Bison use of the packed road system adversely impacts geothermal areas by artificially inflating the bison population size resulting in increased bison use of, and impacts to (i.e., soil compaction, grazing, browsing), geothermal areas. Such impacts lead to a decline in the ability of geothermal habitats to provide survival habitat during winter, particularly severe winters. As a consequence, without sufficient survival habitat, a severe winter or series of severe winters will result in larger number of bison emigrating from Yellowstone to Montana where they are likely to be killed. Depending on the severity and frequency of future winters, the continued existence and bison use of the packed road system -- due to all of its direct, indirect, and cumulative impacts -- could result in a significant decline of the Yellowstone bison population.

There is no dispute that Yellowstone bison use the packed roads as travel routes. The controversy surrounds the frequency of bison use of the packed road system and the short and long-term implications (i.e., energetic, ecological, physiological) of such use. The controversy is misplaced and is primarily a product of short-term, deficient, and ill-conceived studies and/or analyses prepared to evaluate the issue. The reality is that bison use of the packed road system has been ongoing for over 20 years and is well documented by scientists, the NPS, and the public.

Aune (1981), Meagher (1993), Meagher et al. (1997), Meagher et al. (2001), Taper et al. (2001), Bjornlie (2000, 2001), and Yellowstone scientists (Kurz et al. 2000, Reinertson et al. 2001), for example, have documented bison use of the packed road systems. While the extent of bison use of the road system is variable, the design and methodology of the individual studies

make comparisons problematic. Moreover, bison numbers, bison density, and winter severity may also influence the frequency of such use. However, even if such use is limited this does not mean that the implications of such use is not significant. Given the severity of the winter conditions in YNP, even limited use of packed/groomed roads can result in energetic benefits or consequences (depending on how individual bison respond to snowmobiles) that can have significant implications. As explained by Dr. Meagher in her May 22, 2002 comments on the SEIS, "in a very harsh living situation, small shifts in the environmental parameters (in this case, additional human-created, energy-efficient travel linkages) can have consequences that would not occur in less-harsh circumstances."

In addition to "scientific" evidence, anecdotal reports of bison use of packed/groomed roads are numerous. The NPS asserts that such "anecdotal observations represent the best available site specific information and are viewed ... as a useful means to characterize situations commonly encountered along park roads in the winter." SEIS at 117. Newspaper and magazine stories about snowmobiling/wildlife in YNP provide many of the anecdotal reports of bison use of the packed/groomed road system. In addition, the NPS's bison "ping-pong" videotape, interventions by NPS rangers to protect traveling bison from snowmobilers, and individual ranger accounts provide additional evidence of bison use of the packed road system (see also, SEIS at 121 (Table 20) and 211 (Table 76)). Indeed, as reported in the SEIS, written accounts of wildlife/visitor conflicts in YNP by rangers "all emphasized the frequent, often daily, occurrence of conflicts among ungulates (primarily bison) and oversnow motorized use, particularly snowmobiles." SEIS at 116. These conflicts included snowmobilers unsafely passing bison (on the roadway), bison being herded down the road, snowmobilers driving into the middle of a group of bison (on the roadway) thereby aggravating the bison and increasing safety risks to both snowmobiler and bison, and snowmobilers being cited for off-road violations when they left the packed/groomed road surface to go around bison (who were on the roadway). SEIS at 116/117. The NPS concludes that such "harassment" is inevitable along some road segments in YNP due to the "juxtaposition of heavily used groomed motorized routes and ungulate winter range." SEIS at 117.

While the available evidence suggests that bison use of the packed road system is more frequent than that documented by Bjornlie or YNP scientists, the energetic implications of such use, even if limited, could tip the energetic scale of individual animals in favor of survival given the fine energetic line that animals walk during winter in the GYA. The NPS claims that energy savings associated with the use of packed roads could be usurped by energy losses caused by bison flight in response to snowmobiles. SEIS at 124. While there is no question that some bison may choose to share the road with snowmobiles while others flee, and that such behaviors may change during the course of the winter (i.e., habituation may occur), both impacts (i.e., flight resulting in energy loss and tolerance resulting in energy savings) cause the disturbance of bison that is not permissible under NPS regulations.

Despite the evidence documenting bison use of the packed road system and the consequences of such use, the NPS continues to discount and/or ignore such evidence. Instead,

desperately clutching to anything that will prevent it from having to address the road packing issue, the NPS has consistently called for greater study of the issue while claiming that data collected by Bjornlie (2000), Bjornlie and Garrott (1998) and through Yellowstone's own studies (Kurz et al. 2000, Reinertson et al. 2001) demonstrate that bison use of packed roads is limited.

In the SEIS, while admitting that the "parks have documented ... harassment and unintended impacts on wildlife from groomed trails and their use," SEIS at v, and that "the impact of groomed surfaces and their use on wildlife" is a major issue, SEIS at viii, the NPS largely ignores the potential severity and significance of such impacts. For example, the SEIS states that "ongoing monitoring of the bison population continues to support the contention that bison use of groomed routes is relatively minor compared to their use of established game trails and other off-road travel corridors (Reinertson et al. 2001)." The SEIS does concede, however, that Reinertson et al. (2001), in an apparent attempt to recognize the long-term data collected by Dr. Meagher, "acknowledge that longer term studies of bison movements, distribution and population dynamics indicate that bison use of groomed roads may have shifted the cumulative energetics of bison behavior, movement patterns and survival of winter groups within YNP." SEIS at 124. Considering the evidence presented previously documenting the implications of bison use of the packed road system (see, Enclosures 1, 2, 4, and 5), including data from over 30 years of bison distribution, movement, habitat use, and population dynamic studies conducted by Dr. Mary Meagher, the NPS is clearly and purposefully, yet inexplicably, ignoring this evidence to avoid any substantive analysis of this issue.<sup>12</sup>

The Fund has previously disclosed and discussed the deficiencies in the analyses of bison use of packed roads and the implications of such conducted by Bjornlie, Yellowstone, and Cheville and McCullough (see Enclosures 1 and 2). Given these significant deficiencies, the NPS should not rely on these studies in determining the implications of wildlife use of packed/groomed roads. It is important to note, however, that research done by Bjornlie and YNP staff has found that a large percentage of bison (e.g., 100 percent in the Hayden Valley as documented by Kurz et al. 2000) were regularly observed within 25 meters of a packed/groomed road suggesting the animals had relatively easy access to the packed road system.

Conversely, the data collected by Meagher and subsequent reports and studies are based on one of, if not the most, comprehensive data sets on the distribution, movements, habitat use patterns, and population dynamics of a large ungulate ever assembled. These data cannot be ignored by the NPS. Nor can it ignore the implications of the data which demonstrate a western

<sup>12</sup>As reported by Dr. Meagher in her May 22, 2002 comments on the SEIS, not only did the NPS fail to consider or even cite to a recent report entitled "The Phenology of Space: Spatial Aspects of Bison Density Dependence in Yellowstone National Park," Taper et al., 2000, prepared under contract with the U.S. Geological Survey which is directly relevant to the relationship and impacts associated with bison use of the packed road system, but the NPS, particularly senior staff members, have consistently avoided any efforts to meet with Dr. Meagher and her colleagues to discuss their findings and the complexities inherent to this issue.

shift in bison movement, distribution, and habitat use patterns, artificial and unnatural alterations in bison population dynamics, an increase in the number and rate of bison emigrating from Yellowstone to be harassed and killed in Montana, increased bison use and degradation of critically important geothermal habitat (survival habitat), a reduction in the number and availability of winter-killed bison to grizzly bears and other wildlife, and broader ecological impacts to Yellowstone. These are not speculative impacts but, in fact, have been indisputably documented by Meagher and others in recent analyses.

For example, in a manuscript entitled "Recent changes in population distribution: the Pelican bison and the domino effect," prepared for a YNP science workshop conducted in October 2001, Meagher et al., provide credible evidence of the long term and complex impacts of bison use of packed/groomed roads on bison distribution, movements, habitat use, population dynamics, and on YNP ecology (see Enclosure 6). In the manuscript abstract, they state:

Over roughly 20 years, an apparent ecosystem change has occurred involving the bison of the interior of Yellowstone National Park. Although complex and interactive factors involving climatic variation and bison social behavior seemed likely have had a role, another element may have been human-generated. In recent decades, recreational use by people of the park's interior road system in winter resulted in compacted snow surfaces that, in certain locations and times, provided ready-made travel linkages between locations where bison preferred to be. This was seen first in 1980 with bison located on the packed road surface west from the Mary Bay site of the traditional Pelican winter range. The observed changes may not have reached their maximum expression, but the future for the Yellowstone bison does not appear reassuring.

In Taper et al. (2000) ("The Phenology of Space: Spatial Aspects of Bison Density Dependence in Yellowstone National Park"), evidence gleaned from nearly four decades of data on bison observations in YNP further document the impacts of bison use of packed/groomed roads on bison and park ecology (see Enclosure 7). Some excerpts from that study are worth reprinting here:

...snow-packed interior winter roads that existed prior to the stress-induced movements by the Pelican area bison encouraged the beginnings of bison population adaptation in YNP to use of road sections as energy-efficient linkages between suitable locales and foraging sites to which movements might not otherwise become repetitive, especially by mixed groups.

As bison learned travel routes and destinations, more survived by moving to less-harsh conditions, and numbers increased. It appears that the impetus for the population change was triggered by the development of snow-packed energy-efficient interior roads. These were established shortly before the interactive factors of bison numbers combined with increasingly severe winter conditions produced exploration. From a bison perspective, move and live if possible, or die.

An additional factor is relevant here. It is apparent that bison could survive by breaking social bonds and scattering to small sites where a few animals could survive. However, the gregariousness of bison is the stuff of legend -- the huge aggregations reported for the Great Plains (Roe 1970). Over time, it has become apparent that when bison are free-ranging and can move, they will move to stay together and maintain their social bonds, rather than scatter. This factor is fundamental to the ease with which bison began to use sections of road. When bison did this in the Pelican area, more of the population survived, and more bison moved to Hayden Valley. But, Hayden Valley was occupied, so more bison moved west, and developed habitual usage of road section usage, foraging sites, and attractive destinations. The population increased greatly, and shifted westward.

Furthermore, in her May 22, 2002 comments on the SEIS, Dr. Meagher expresses grave concern for the future of Yellowstone's bison due to the direct, indirect, and cumulative impacts and implications of bison use of the packed road system. While a cause and effect relationship between the bison use of packed travel linkages and bison numbers is not clear, this is not unexpected given the ecological complexity of this issue and the number of interactive/additive factors that may be involved. What is clear is that certain road sections serve as "energy-efficient travel linkages" for bison resulting in a shift in the "relationships of winter energetics for this species." Indeed, the data analysis contained in Taper et al., (2000), document changes in the bison population that "bear directly on the distribution and numbers of bison, and perhaps even on their presence." As reported by Dr. Meagher:

Given the documentation of distribution changes, the wild bison are disappearing as a wintering population from the Pelican country. Their land use patterns already have become quite fluid geographically, so their numbers decrease throughout the winter. By winter's end in late May, the numbers of mixed group bison (including cows and calves) has been lower the last couple of years than at any time since the near-extirmination. This has happened regardless of below-average winter snowpacks. ... Sadly, this is the first spring in centuries that there have not been over-wintering bison cows with new calves in Pelican Valley. They survived there during the Little Ice Age and the winter of 1996-97. Based on archeological data, they have done so for some 1000-2000 years. Now they leave to maintain social bonds, rather than doing some scattering as the survival mechanism that allowed this breeding nucleus to remain regardless of conditions. ... Changes likely will continue in the rest of the population as well, because bison will move if possible to maintain social bonds.

Dr. Meagher has documented that bison use of the packed road system has resulted in an ecosystem change with impacts both on other species (i.e., grizzly bear) and on habitat. In regard to the latter issues, Dr. Meagher states:

A strong case can be made also for attendant habitat degradation. Not only did numbers double by 1994, but the relative distributions changed enormously, and continued data analyses documented significant changes in bison habitat use. There are and likely will

continue to be long-term effects on both flora and fauna, including effects on the food sources for grizzly bears and wolves. Further, an ecosystem change inevitably will involve aspects presently unknown.

Finally, Dr. Meagher issues a warning to the NPS (a warning that has consistently been ignored) regarding the future of Yellowstone's bison in which she concludes that the "future of the bison is bleak" if "the system of roads presently in use for winter access remains unchanged."

Except for Dr. Meagher's May 22, 2002 comments on the SEIS, her October 2001 report and Taper et al. (2001) were completed since the FEIS and ROD were published but, suspiciously, were not evaluated in the SEIS. Such an oversight, intentional or not, is in direct conflict with the explicit intent of the NPS to use the SEIS to consider "other significant and relevant new or updated information not available at the time of the earlier decision." SEIS at 4. The complete or nearly complete disregard for these studies and, for that matter, previous reports, reviews, and studies prepared by Dr. Meagher and others (i.e., Caslick 1997) not only violates the intent of NEPA and the SEIS, but is indicative, as previously stated, of a larger effort by the NPS to avoid any substantive analysis of this issue.

The impact of bison use of the packed road system is not limited to bison. Indeed, not only does a number of wildlife species (i.e., elk, mule deer, coyotes, moose) potentially use packed roads to facilitate movements with a variety of potential adverse impacts, but wildlife, particularly bison and elk, use of the packed road system can have direct, indirect, and cumulative impacts on other species, particularly grizzly bears.<sup>13</sup> The Fund previously provided a detailed examination of such impacts (see, Enclosures 1, 2, 4, and 5).

In sum, bison and elk, represent an incredibly important food source for Yellowstone's grizzlies. While grizzlies may hunt and kill bison and elk, winter-killed bison and elk carcasses provide a valuable food source particularly upon den emergence in the spring. Whether grizzlies can access such carcasses depends on carcass location in relation to roads and human developments. The availability of such carcasses is significantly lower if the carcasses are located near roads or human developments. Yellowstone's packed road system, due to its location in lower elevation habitat and through the geothermal areas, acts as a natural magnet for ungulates, including bison and elk, and provides an energy efficient or deficient (depending on the individual animal's response to snowmobile/snowcoach traffic) travel route facilitating access to alternative wintering sites. As a result, bison and elk use of the road system, reduces the proportion of individual animals succumbing to natural winter kill and reduces the accessibility (due to roads and human developments) and the availability (due to the killing and removal of bison outside of YNP) of winter-killed carcasses to grizzly bears. Such affects may result in significant adverse impacts to the survival and viability of individual grizzly bears and the grizzly bear population in

<sup>13</sup>Wolves and Canada lynx may also be adversely affected due to the existence and wildlife use of the packed/groomed road system. Enclosures 1, 2, 4, and 5 provide additional discussion of this issue.

the Greater Yellowstone Ecosystem.

While there continues to be debate over the estimated number of grizzly bears in YNP, the long-term security of this population remains at risk due to continued habitat loss and fragmentation, development pressures, an increase in the number and activities of humans, and because of a decline in the quantity of the primary grizzly bear foods (i.e., cutthroat trout, army cutworm moths, whitebark pine seeds, and ungulate carrion). While the availability of these different food items can vary from year to year, the abundance and availability of each is subject to one or more threats. Cutthroat trout are adversely affected by competition with the introduced lake trout. Army cutworm moths are threatened by pesticide use (outside the park). The availability of whitebark pine seeds has declined, in some years substantially, due to blister rust infection in whitebark pine trees. Indeed, virtually all the whitebark pine in this system is projected to be lost either to an exotic pathogen or to global climate warming (Kendall 1995, Mattson et al. 2001) which, particularly in YNP, will substantially reduce the robustness of the grizzlies range (Mattson and Merrill, in press). And, as previously mentioned, the availability and accessibility of ungulate carrion, particularly bison carrion is threatened by bison attraction to and use of packed/groomed roads, a reduction in natural winterkill, and the killing and removal of bison outside of YNP. As one or more food items decline in abundance and/or availability, the other primary food items become more critical to the grizzly bears. Thus, as whitebark pine seeds continue to decline, the availability and accessibility of ungulate carrion will increase in importance to grizzly bears. Furthermore, since many of the causes of grizzly bear food declines are associated with exotic species (i.e., lake trout, *B. abortus*, and white pine blister rust) prompting Reinhart et al. (2001) to conclude that the potential negative impacts from such exotic species have only begun to unfold and that such species may lead to the loss of substantial high-quality grizzly bear foods, including much of the bison, trout, and pine seeds that YNP grizzlies currently depend upon.

Despite these potential and significant direct, indirect, and cumulative impacts to grizzly bears caused by packed/groomed roads and bison use of such travel linkages, the NPS has failed to properly analyze these issues as required by Section 7 of the Endangered Species Act. Thus, despite preparing a 53 page Biological Assessment in 2000 to evaluate the impacts of winter use management on federally-listed species, not a single page, paragraph, or sentence evaluated the impact of bison use of the packed/groomed road system on grizzly bears and other protected species. Though The Fund raised this issue in its comments on the DEIS and FEIS (Enclosures 1 and 2), the NPS has failed to correct this deficiency. Since there is no indication that the NPS intends to properly evaluate the impact of packed/groomed roads and wildlife, particularly bison, use of such roads on grizzlies and other protected species, my clients hereby provide the requisite notice of their intent to sue the NPS for its blatant disregard for its legal obligations under the Endangered Species Act.

In addition to its failure to seriously consider a no-oversnow motorized access, no-road packing grooming alternatives as required by NEPA and to evaluate the impacts of packed/groomed road and wildlife, particularly bison, use of the road system as required by the

ESA, the NPS has also neglected to properly evaluate the environmental impacts of a snowcoach access only strategy on park wildlife, resources, and values. As The Fund explained in Enclosures 1 and 2, the prohibition of snowmobile use in the parks, while beneficial, could result in increased direct, indirect, and cumulative impacts associated with wildlife use of the packed/groomed road system. By limiting oversnow motorized access to snowcoaches, the number of vehicles using the packed roads each day will decline. Consequently, wildlife, including bison, use of the packed/groomed roads may increase, potentially significantly, and could result in serious and adverse impacts to a variety of wildlife by unnaturally or artificially altering: wildlife distribution, movement, and habitat use patterns; population dynamics; predator/prey interactions; and ecological relationships and processes within the parks. The benefits of packed road use in terms of energy conservation will increase substantially as there will be less vehicle traffic and, thus, less opportunity for a negative interaction with a vehicle (depending on the species and time of year). The NPS assumes that such impacts (i.e., reduction in oversnow vehicle numbers, less potential for harassment/displacement) will be beneficial to wildlife but has blatantly ignored all of the potential adverse impacts associated with this scenario.

Similarly, since the NPS has failed to consider a no-oversnow motorized access, no-road packing/grooming alternative, it has no means of assessing the potential beneficial impacts from such an alternative. Restoring naturalness, reestablishing natural regulation processes, and providing maximal protection to park wildlife by prohibiting oversnow motorized vehicle access and road packing/grooming provides enormous benefits to the ecology and integrity of the parks. Furthermore, such an alternative would, in time, result in a smaller bison population, a reduction in the number and rate of bison emigrating from the park, a decline in the potential for *B. abortus* transmission to domestic cattle (admittedly, the existing transmission potential is extremely remote if it even exists), and would likely benefit other species, like grizzly bears, who would have greater access to winter killed bison and elk carrion.

The direct, indirect, and cumulative impacts associated with wildlife, particularly bison, use of the packed road system easily satisfies the impairment and disturbance standards which dictate park and visitor use management. Due to NPS failure to evaluate the potentially significant adverse impacts to grizzly bears and other protected species attributable to wildlife, particularly bison, use of the packed/road system it is also in violation of the Endangered Species Act. Finally, the NPS failure to seriously consider a no-oversnow motorized access, no-road packing/grooming or to fully evaluate the environmental impacts of a snowcoach access only policy is in violation of NEPA and NPS policies. Despite these indisputable deficiencies (all of which have been previously identified), the NPS has failed to: 1) seriously evaluate any alternative that would eliminate these impairments/disturbances in violation of NEPA and NPS policies; 2) to take action to eliminate impairment/disturbance as required by the NPS Organic Act, regulations, and policies; 3) to prepare an impairment assessment on the impacts of wildlife use of the packed/groomed road system which is required by NPS-12 (the NPS policy on the preparation of environmental documents), SEIS at 16; and 4) properly evaluate the impacts of the packed/groomed road system and wildlife, particularly bison, use of the system on federally-listed species.

Though the NPS has failed to designate the impacts of wildlife use of the packed road system as an impairment, it offers mitigation measures to ostensibly reduce such impacts. SEIS at 20/21 or 37. Such measures, which include continuing to assess grizzly bear abundance, distribution, and habitat selection, and continuing to monitor bison use of groomed, ungroomed, and plowed surfaces, are not nearly sufficient to eliminate this impairment. Monitoring will not eliminate this impairment. Prohibiting road packing/grooming is the only way to eliminate the impairment to bison, grizzly bears, and other park wildlife associated with wildlife use of the road system.

2. The SEIS does not Contain New Information or Evidence Which Justifies Reversing the Decision to Phase Out Snowmobile Use in the Parks. At a Minimum, Though not Consistent with NPS Legal Mandates, the NPS must Select and Implement Alternative 1A as its Preferred Action.<sup>14</sup>

The SEIS is the product of a politically-influenced settlement agreement resulting from a lawsuit filed by the International Snowmobile Manufacturers Association (ISMA). The plaintiffs in *ISMA v. Norton* alleged, and ultimately the NPS inappropriately conceded, that the analysis in the DEIS and FEIS -- specifically in regard to technological improvements to reduce snowmobile emissions and noise -- was not complete and that the NPS failed to provide sufficient opportunity for public comments.<sup>15</sup> Far from being legitimate, these excuses were manufactured by the government to justify the settlement agreement and its ulterior motive to reverse the snowmobile phase-out decision made by the Clinton administration. The reality is that the decision to phase-out snowmobiles from the parks was based on over a decade of study and a substantial amount of public input (including over 65,000 comments submitted in response to the DEIS and FEIS). Indeed, as reported by the Environmental Protection Agency (EPA), "this DEIS includes

<sup>14</sup>This section is provided to evaluate the evidence presented in the SEIS that provides additional support for the immediate implementation of the 2000 decision to phase-out snowmobiles. As previously explained, while my clients support the phase-out of snowmobiles, they do not believe that this alternative will provide the required protection to park wildlife, resources, or values and that, therefore, this alternative is in violation of NPS statutes, regulations, and policies. It should be noted that the no-oversnow motorized access, no-road packing/grooming alternative endorsed by my clients would eliminate all adverse impacts to wildlife, air and water quality, natural quiet, and to park visitors engaged in non-motorized recreational activities that would continue (to varying degrees) under any of the alternatives (including Alternative 1A) proposed by the NPS.

<sup>15</sup>Other claims made by the plaintiffs include the NPS' failure to give legally mandated consideration to all of the alternatives, making political decisions outside the public process and contradictory to the evidence and data, failure to adequately consider and use the proposals and expertise of the cooperating agencies, failure to properly interpret and implement the parks' purpose, discrimination against disabled visitors, and improper adoption of implementing regulations. SEIS at 2. None of these claims have merit.

extensive analysis of the effects from current winter use and that analysis demonstrates significant environmental and human health impacts," and that "this DEIS includes among the most thorough and substantial science base that we have seen supporting a NEPA document." EPA Comments on DEIS (undated).<sup>16</sup>

Moreover, though the settlement agreement in 2001 required the plaintiffs to provide exhaust and noise emissions of new snowmobile technology by July 29, 2001, no substantive new snowmobile emission and noise data were provided by that date and, in fact, it remains unclear what, if any, new data were ever provided. Assuming the plaintiffs provided any substantive new emission and noise data, the FEIS already evaluated the environmental impacts of such technological improvements and determined that these alternatives would result in an impairment to park wildlife, resources, and values and, therefore, were not acceptable.

Without any substantive new evidence -- which is precisely the case here -- the SEIS is a 2.5 million dollar waste of money, time, and effort intended to reverse the snowmobile phase-out decision contained in the ROD. Because the phase-out decision has already been made, the Bush Administration, DoI, and NPS must provide a "reasoned analysis" in order to meet the legal standard required to reverse or otherwise modify the phase-out decision. Meeting this standard, given the lack of any compelling new evidence suggesting that snowmobiles have a benign or non-significant impact on the environment and the inclusion of additional evidence documenting the adverse impact of snowmobiles, is impossible. Snowmobiles, even those that generate less emissions and noise than their mechanical predecessors, are still not clean or quiet and they cause adverse impacts (i.e., disturbance, impairment) to wildlife, air and water quality, solitude and serenity, and park visitors enjoying non-motorized recreational pursuits. Thus, not only can the NPS not meet the "reasoned analysis" standard to reverse the decision to phase-out snowmobiles, but its own statutes, regulations, and policies require it to ban snowmobile use, snowcoach operation, and road-packing/grooming activities.

The FEIS and ROD provide a smorgasbord of evidence documenting the adverse impact of snowmobiles on the parks and park wildlife, air and water quality, natural quiet, and park visitors who participate in nonmotorized recreational activities. While it is unnecessary to identify all such evidence (which is already part of the record), some examples deserve to be emphasized.

In the ROD, the NPS concludes that:

<sup>16</sup>Moreover, in its comments on the SEIS, the EPA states that, "the assessment of impacts in the DSEIS and FEIS is supported by an extremely thorough and credible body of human health, environmental, and wildlife science, much of which is site-specific to the Yellowstone ecosystem. NPS, academic and agency researchers have actively studied the impacts of snowmobile use for over 10 years in these Parks. The Yellowstone ecosystem has the benefit of more peer-reviewed scientific research on the effects of motorized winter recreation than any other place on earth."

The use of snowmobiles and snowplanes at present levels harms the integrity of the resources and values of these three parks, and so constitutes an impairment of the resources and values, which is not permissible under the NPS Organic Act. In YNP, the impairment is the result of the impacts from snowmobile use on air quality, wildlife, the natural soundscape, and opportunities for enjoyment of the park by visitors. In GTNP, the impairment is the result of the impacts from snowmobile and snowplane use on the natural soundscape and opportunities for enjoyment of the park by visitors. In the parkway, the impairment is the result of impacts from (sic) snowmobile use on air quality, the natural soundscape, and opportunities for enjoyment of the park. ROD at 18/SEIS at 274.

While this decision suggests that reducing snowmobile numbers could eliminate the impairment, the NPS found that such actions would still not remedy the identified impairment. Specifically, the NPS held that:

Even with technical advances in snowmobiles, the impacts of snowmobile use on wildlife, especially ungulates using groomed routes, constitutes disturbance and harassment at a time when individual animals are particularly challenged for survival. The continued use of snowmobiles as provided in the alternatives studied other than alternative G is found to be inconsistent with the health and integrity of resources existing in the three park units. Continued use hinders the enjoyment of resources and values for which the parks were created, most notably natural soundscapes, clean and clear air, and undisturbed wildlife in a natural setting. ROD at 19/20.

In other words, even if the snowmobile manufacturers suddenly produced clean, quiet, and odorless snowmobiles -- technology that largely remains elusive -- recreational snowmobile use in any amount would continue to adversely impact park wildlife through disturbance and harassment and, thereby, would represent an impairment.

Finally, the NPS concluded that:

...snowmobile use now occurring is inconsistent with the requirements of the Clean Air Act (in the case of YNP and the Parkway), Executive Orders 11644 and 11989, the NPS's general snowmobile regulations, and NPS management objectives for the parks. ROD at 19.

Because of the determination that snowmobile use results in an impairment to park wildlife, resources, and values, the NPS selected Alternative G (snowcoach only access) as the only alternative that is consistent with NPS legal standards.<sup>17</sup> The EPA agreed with this selection

<sup>17</sup>My clients, as previously indicated, agree that prohibiting snowmobiles from the parks will provide benefits to park wildlife, resources, and values but they strongly disagree with the assertion that oversnow motorized access to the parks via snowcoaches is consistent with NPS legal mandates.

concluding in its comments on the FEIS that "Alternative G best assures the protection of human health, wildlife, air quality, water quality and visibility." EPA Comments on FEIS (October 31, 2000). This is not to suggest that a no-oversnow motorized access, no-road packing/grooming would not provide additional positive benefits to human health, wildlife, air quality, water quality, and visibility far in excess of those provided by Alternative G.

The SEIS does not provide any evidence to reverse the selection of Alternative G (Alternative 1A in the SEIS) as the preferred alternative. If anything, evidence contained in the SEIS provides further support for the decision to phase-out snowmobile use in the parks.

For example, the SEIS concludes that:

\* Alternative 1A and 1B would improve the conditions of the natural soundscape significantly. SEIS at ix. Alternatives 2 and 3 would result in 20 and 10 times, respectively, the impact on the natural soundscape compared to Alternatives 1A and 1B. SEIS at x.

\* Alternatives 1A and 1B would improve air quality in the parks more than the other alternatives. Alternatives 1A, 1B, 2, and 3 would produce 25, 25, 75, and 33 percent, respectively, of the total emission currently generated. SEIS at x.

\* Alternatives 1A and 1B result in reduced traffic volumes, lower average travel speed, and scheduled and controlled travel operations causing the least impacts to ungulates. SEIS at xi. Alternative 2 and 3, by comparison, which involve a larger number of vehicles being operated in an uncontrolled manner will have greater impacts.

\* Alternatives 1A and 1B would have the least impact on public and employee health and safety by eliminating snowmobile accidents and reducing pollutants. SEIS at xi.

\* In the affected environment section of the SEIS, the NPS stated that, "whether on duty or conducting personal business on their days off, employees living and working in the interior of the parks are exposed to health and safety risks of winter use within YNP. In conducting routine tasks, employees can be regularly and recurrently exposed to the hazards of loud sounds, exhaust emissions, repetitive motions, spinal and musculature impacts from traveling extremely rough roads, avalanches, and sharing the roadway with inexperienced and unsafe snowmobilers." SEIS at 112. OSHA found that employees working the express lane (primarily outside the kiosk booth) at the West Yellowstone entrance were overexposed to noise, benzene and formaldehyde (both known carcinogens), and carbon monoxide during the admission of snowmobiles into the park. SEIS at 113.

\* A synopsis of the NPS review of the literature on the impact of winter recreation on wildlife documents different wildlife responses to recreation activities (disinterest to flight), reports that every such response, including non-overt responses, has a cost in energy consumption, that such responses can include displacement from areas adjacent to snowmobile

routes, and that such interactions significantly increased energy expenditures. SEIS at 118. The interactions were so significant on the road between West Yellowstone and Old Faithful that Aune (1981) concluded that such interactions result in a serious problem to wintering ungulates. *Id.* Caslick (1997) also expressed concern about the juxtaposition of heavily used oversnow motorized routes and critical winter range in YNP, felt that snowmobiling in thermally influenced wildlife ranges in YNP to be the most pressing visitor use management issue, and noted that there is no reason to believe that the impacts of snowmobiles documented on ungulates outside of YNP in Montana and Wyoming would not occur in YNP where winter conditions are more severe and the intensity of snowmobile use is generally higher.<sup>18</sup> *Id.*

The NPS expressed its concurrence with the literature reviews, SEIS at 118, and indicated that it "maintains, as concluded in the FEIS and ROD, that there are indeed effects to wildlife from oversnow motorized use, and that these effects are adverse." *Id.* It further states that "the parks were established, in part, to provide areas of security for wildlife." *Id.*, and that "population level effects do not need to be indisputably proven in order for the parks to make a determination that adverse effects to animals are occurring as a consequence of oversnow motorized use in critical ungulate winter range." *Id.*

\* "Effects associated with oversnow motorized use include disturbance to wildlife from the sight, sound and smell of the machines, and the presence of groomed roads and trails to facilitate their use." SEIS at 207.

\* The air quality benefits of implementing Alternative 1A would be "major and long term due to the elimination of all potential snowmobile accidents in the three parks." SEIS at 165. Moreover, "high levels of NAAQS (National Ambient Air Quality Standard) pollutants would not be likely to occur, therefore members of the public (and employees) who are susceptible to respiratory problems would not be affected." *Id.* and SEIS at 168.

Such evidence makes it clear that the NPS, at a minimum, must select Alternative 1A as its preferred alternative. This alternative, however, does not fully comply with NPS statutes, regulations, and policies as it would continue to permit activities that constitute an impairment of, or result in the disturbance of, park wildlife, resources, and values.

### 3. Specific Comments on the Content and Analysis in the SEIS:

Even a cursory review of the SEIS reveals that it was prepared in great haste to meet the time deadlines imposed in the ISMA settlement. While such deadlines are not entirely the fault of the NPS and, indeed, were necessary to ensure no delay in implementing the snowmobile ban (if Alternative 1A is selected), the rush to complete the SEIS has raised several issues that require comment.

<sup>18</sup>What the NPS failed to report is that Caslick (1997) recommended that the majority of the interior of YNP be closed to private and commercial snowmachine use.

A. While public surveys are a common tool used by the NPS, other organizations, and the media to gauge public opinion about a particular question or issue and may be used by the NPS to guide management decisions and actions, the NPS must not place significant emphasis on the results of such surveys involving winter use management. This is not a criticism of the survey methodology nor is it intended to suggest that survey results are neither interesting nor valuable, but public surveys are not an appropriate or legal basis for determining proper management of the parks. The reality is that survey questions can be intentionally designed to produce a desired outcome that may reflect the bias inherent in the specific question instead of documenting actual public preference. Moreover, as is evident from several of the surveys conducted on winter use and bison management issues over the years, including additional background information about a particular subject in a survey methodology can completely alter public attitudes and opinions.

Whether snowmobiling, snowcoach operation, or road packing/grooming is to be permitted in the parks must be based on whether such actions, based on the best available scientific evidence, violate the impairment and/or disturbance standards imposed by the NPS Organic Act and corresponding regulations. If the determination is that such actions exceed these standards -- as it should be -- then the actions have to be eliminated regardless of public survey results. Thus, while eliminating oversnow motorized access and road packing/grooming in Yellowstone may not be a publicly popular decision, NPS legal mandates require it to ban such activities if they exceed the impairment/disturbance standards.

B. The involvement of the state and county cooperators in the SEIS is in violation of NEPA (see Enclosures 1 and 2 for additional discussion of this issue). To qualify as cooperators, NEPA requires that agencies have "special expertise with respect to any environmental impact involved in a proposal..." 40 C.F.R. §1508.5. In this case, neither the NPS nor the cooperators have ever disclosed or evaluated the alleged "special expertise" brought to the table by each of the cooperating agencies. For example, while it is clear that the State of Idaho has an interest in winter use management in the parks, there is no evidence that it has any specialized or particularized expertise in issues relevant to the analysis to qualify as a cooperator. That is, while it may have expertise in wildlife management or air quality issues, there is no evidence that it has "special expertise" in the area of the impact of oversnow motorized recreation on wildlife or the affect of snowmobile emissions on air quality, human health, or the ecology of the parks. Even if such specialized expertise exists, Idaho does not bring anything to the process that NPS experts do not already possess. The inclusion of the states and counties in the original DEIS process was the result of political chicanery orchestrated by the Council on Environmental Quality without acceptance or approval by the NPS or DoI. The DoI/NPS exacerbated this initial mistake by inviting the cooperators to participate in the SEIS process.

C. The NPS has gone to great lengths in its evaluation of the role of winter use management actions in the economies of the three-state, certain counties, and select gateway communities. Such efforts, while enlightening and interesting, were not necessary (see, Enclosures 1 and 2 for additional discussion of this issue). NEPA includes "economics" in its definition of "effects." 40 C.F.R. §1508.8. Thus, an assessment of the impact of the alternatives on the economy is essential



but the scope of such an analysis should have been limited to the economic impact to the parks proper and should not have been extended to the gateway communities, adjacent counties, or the three states. The question that should have been evaluated was what positive, negative, and direct, indirect, and cumulative economic impacts to the parks would occur under the different alternatives evaluated in the SEIS. Such an analysis should have, for example, considered the economic impacts to the NPS and the parks associated with a reduction in entrance fees, the economic value of restoring naturalness and reducing pollutants in the parks, the economic benefits of increasing wildlife protection, and the economic impact on NPS and concessionaire employees who work in the parks.

The economic impacts of the alternatives on the states, counties, and communities adjacent to the parks are for those entities to evaluate and consider. The NPS is not responsible for the economic well-being of those entities and certainly cannot undermine its legal obligation to protect the parks because of misguided management decisions made by those entities. Thus, while West Yellowstone, MT has given itself the moniker of "Snowmobile Capital of the World" and has engaged in extensive development activities, the NPS is not responsible for the city's failure to diversify its economy or for assuming that snowmobiles would always be welcome in Yellowstone. If the West Yellowstone economy declines as a result of a prohibition of snowmobiles in Yellowstone (as certain business interests have predicted), it is neither the fault nor should it be the concern of the NPS. While NPS policy encourages a cooperative relationship with gateway communities to resolve issues of conflict, it doesn't require the NPS to keep the cash registers ringing nor is the NPS allowed to compromise its protection of the parks and their wildlife, resources, and values to benefit adjacent communities, counties, or states.

Even though the NPS has gone well beyond its legal obligations in addressing the economic impacts of the winter use alternatives, it is worthwhile to note that the NPS has concluded that the economic impacts of Alternative 1A would entail a "minor" impact on the economic impact of the five counties adjacent to the parks, SEIS at 153, a "minor impact" on the year-round economy of West Yellowstone, SEIS at 154, and a negligible negative impact in the context of the 3-state economy, SEIS at 155. Even these conclusions, however, are flawed in that the economic analysis was not complete. Not only did the NPS fail to consider the potential increase in use of the parks by residents and non-residents who have never recreated in the parks, but it also neglected to quantify the economic value of increased benefits to wildlife, air and water quality, and natural quiet associated with banning snowmobile use.

D. While the impacts of snowmobiles, snowcoaches, and road packing/grooming practices to wildlife are serious and significant, they have been overshadowed by the controversy surrounding snowmobile emissions and air pollution. Indeed, the alleged failure of the NPS to consider technological advancements in snowmobile engine design and function was the primary basis for the ISMA lawsuit. As a result, the ISMA settlement agreement explicitly provides the plaintiffs with an opportunity to submit new data/evidence touting the industry's technological advancements in snowmobile engine design and emission reduction capabilities. The deadline for such new information, however, passed without any substantive new information from the

plaintiffs (including and representing snowmobile manufacturers) and it remains unclear whether the industry ever provided any new information or whether such new information was significant or substantive. New research identified in the SEIS includes a paper, "Snowmobile Contributions to Mobile Source Emissions in Yellowstone National Park," published in Environmental Science and Technology on the Worldwide Web which determined that snowmobiles account for 27% of the annual emissions of carbon monoxide and 77% of annual emissions of hydrocarbons in YNP -- yet another report documenting how dirty snowmobiles are. SEIS at 101.

Regardless of whatever new information has been provided, albeit well after the deadline for such information as contained in the ISMA settlement, the reality is that the NPS considered several alternatives in the DEIS which were based on a substantial reduction in snowmobile emissions and still concluded that continued snowmobile use constituted an impairment. Though Alternatives 2 and 3 in the SEIS include caps on snowmobile use, the number of snowmobiles permitted in the parks under those alternatives, despite requirements for the machines to emit less pollutants, would continue to constitute an impairment.<sup>19</sup>

The actual analysis of emissions and their impacts in the SEIS is both confusing and deficient. The series of emission tables provide data on the concentrations and ratios of pollutants for Alternatives 1B, 2, and 3 for each year and road segment until fully implemented. Inexplicably, the NPS failed to present data for Alternative 1A (the no-action alternative) for comparison purposes. In addition, several of the tables don't make sense as they assert the claim that emission concentrations and ratios for Alternative 1B at full implementation (snowcoach access only, no snowmobiles) are greater than emission concentrations and ratios for Alternatives 2 and/or 3 at full implementation (snowmobiles use permitted but capped, snowcoaches permitted) (e.g., tables 51, 53, 54, 63, 64, 66) or that emission concentrations and ratios for Alternative 3 (smaller cap on snowmobile numbers) are greater than the emission concentration and ratios for Alternative 2 (larger cap on snowmobile numbers) (e.g., tables 44, 45, 47). The text associated with each table does not provide any clarification as it simply describes what is contained in the tables versus explaining the data and why or how certain emission

<sup>19</sup>The EPA has questioned the legal authority of the NPS to require snowmobile emission reductions independent of the EPA. Consequently, the EPA asserts that the only way the NPS can control snowmobile emissions short of banning all snowmobiles (the EPA's environmentally preferred alternative) is to reduce snowmobile numbers permitted in the parks. EPA Comments on SEIS, April 23, 2002. Even this, however, could not avoid an impairment as the NPS has determined that "even with technical advances in snowmobiles, the impacts of snowmobile use on wildlife, especially ungulates using groomed routes, constitutes disturbance and harassment at a time when individual animals are particularly challenged for survival. The continued use of snowmobiles as provided in the alternatives studied other than alternative G is found to be inconsistent with the health and integrity of resources existing in the three park units. Continued use hinders the enjoyment of resources and values for which the parks were created, most notably natural soundscapes, clean and clear air, and undisturbed wildlife in a natural setting. ROD at 19/20.

concentrations/ratios were higher or lower than others. Furthermore, though the SEIS discusses human health impacts associated with certain snowmobile pollutants, SEIS at 100, it fails to evaluate the synergistic impact of multiple pollutants on human health. Nor has the NPS ever evaluated the impact of snowmobile pollutants on plant survival, growth, production, diversity, susceptibility to disease or the broader ecological implications (see Enclosure 5 and Shaver et al. 1988) for a broader discussion of this issue.

The bottom line is that the NPS is required to comply with the Clean Air Act which requires the NPS to protect parks and wilderness areas like the parks (all Class I areas under the Act) from air quality degradation. SEIS at 100. The EPA, however, has expressed concern that "although exceedance of Ambient Air Quality Standards is entirely avoidable, the DSEIS indicates these standards are threatened in the first two implementation years with several alternatives (1b, 2, and 3)." EPA Comments on SEIS, April 23, 2002. Thus, the EPA concludes that "Alternative 1a, 1b and G (from the FEIS) would, at full-implementation, provide and perpetuate the best possible air quality and visibility in these Parks, comply with all applicable regulation and federal policy with respect to air quality and related values, and eliminate the visibility impairment experienced in these Parks." Id. It should be noted that the EPA's support for alternatives 1A, 1B, and G is based solely on the ability of these alternatives to improve air quality and related values and does not suggest that these alternatives necessarily comply with all relevant NPS legal mandates.

E. The purpose and need for the action is based on a set of desired conditions or objective for winter use management. One of the desired future conditions is that "visitors have a range of appropriate winter recreation opportunities from primitive to developed." SEIS at v. The NPS also refers to a "philosophy of universal access in the parks." SEIS at 35. The NPS improperly relies on these statements to justify the continuation of oversnow motorized access to the parks in violation of NPS statutes, regulations, and policies. The NPS must amend this condition to include reference to its legal mandates. That is, visitors can be provided a range of appropriate winter recreation opportunities from primitive to developed, only if such opportunities are consistent with NPS legal mandates (see, Enclosures 1 and 2 for additional discussion of this issue).

Not only is it clear that the NPS has failed to comply with its legal obligations, the NPS delineates a new desired condition in the SEIS which is entirely inconsistent with its legal mandates. This objective is to provide "recreational experiences ... in an appropriate setting; (which) do not take place where they will irreparably impact air quality, wildlife, cultural areas, the experience of other park visitors, or other park values and resources." SEIS at 14. This new standard -- an irreparable harm standard -- is not consistent with NPS statutes, regulations, and policies that prohibit any activities that result in impairment of, or disturbance to, park wildlife, resources, or values. It is simply impossible to interpret current NPS legal mandates to justify an irreparable harm standard -- a standard that would be exceedingly difficult for many activities to meet or exceed. Many would argue that regulated hunting, for example, would not result in irreparable harm and therefore would be permissible under this new standard. Similarly, selective

logging, oil and gas development, and some mining practices would, according to the advocates of such activities, be able to satisfy this standard. While it is clear that snowmobiling results in impairments to, and disturbance of, park wildlife, would such impact rise to the level of causing irreparable harm?

The NPS must follow all relevant statutes, regulations, and policies in dictating what constitutes appropriate use of the parks. Any use must be able to meet the impairment and disturbance standards. The NPS cannot -- as it has here -- recast its standards to permit public uses that may impair and disturb park wildlife, resources, or values, but that may not result in irreparable harm. If the NPS intends to dictate its management of the parks based on "desired conditions," those conditions must be consistent with NPS legal mandates which require nature preservation and protection over public access and use.

F. The relationship between existing concessionaire contracts and the ability of the NPS to implement an action that may impact such contracts is not clear. According to the NPS, if an implemented action "has affected or would substantially affect a concession operation prior to the expiration of its contract, the action will be implemented only through negotiation or when a new contract is awarded." SEIS at 17. This statement suggests that concessionaires with recently awarded contracts could prevent the full implementation of the preferred action if the concessionaire refuses to negotiate with the NPS. This is unacceptable. If an action, in this case snowmobiling, snowcoach operations, and road packing/grooming, is violating the impairment/disturbance standards the NPS is required to eliminate the impairment/disturbance regardless of whatever contractual obligations it has with a concessionaire. The final SEIS must further clarify this issue.

G. A prohibition on snowmobile use in the parks would also eliminate accidents involving recreational snowmobiles and the number of citations issued by law enforcement staff to snowmobilers. Snowmobilers' disregard for the rules governing snowmobile use in YNP was clearly evident during the 2001-2002 winter use season when the NPS, at the suggestion of snowmobile advocacy groups, increased law enforcement presence throughout the park in order to better monitor and control snowmobilers and, in particular, to reduce the frequency of inappropriate interactions with wildlife. This led to a significant increase in the number of citations issued to snowmobilers for a number of legal transgressions including speeding and trespassing into areas, including wilderness areas, closed to snowmobile use.

#### **CONCLUSION:**

The decision to be made by the NPS is rather simple. Either it complies with its legal mandates and provides the parks, park wildlife, and other park resources with the protection intended by Congress and expected by the American people, or it capitulates to those whose self-serving interests are tied to continued snowmobile use and abuse of the parks. The law is clear, the first and foremost duty of the NPS is to preserve and protect nature, to embrace and implement a natural regulation philosophy and mandate, and to prevent the impairment and/or

disturbance of park wildlife, resources, or values. While permitting public use is also a directive to which the NPS must comply, public use is secondary to nature preservation and can only be permitted when such use will not result in the impairment or disturbance of park wildlife, resources, or values. Thus, regardless of the political pressure, economic arguments, alleged technological advancements, or desperate attempts by snowmobile advocates to reinterpret the mission of the NPS, the law, as enacted by Congress and interpreted by the NPS and the courts, must be the only factor considered by the NPS in concluding the SEIS process.

If the law is followed, the NPS can only make one decision -- to prohibit snowmobile and snowcoach access to the parks and to terminate road packing/grooming activities permanently and immediately. The evidence is clear and indisputable. The over thirty year experiment with illegal oversnow motorized access into the parks has resulted in significant impairment to and disturbance of park wildlife. As such impacts are inextricably connected to both the oversnow motorized access (snowmobile and snowcoach) and to road packing/grooming to facilitate such access, eliminating snowmobiles is not enough to comply with all relevant laws. While there is no question that implementing Alternative 1A would provide benefits to the parks, continuing to pack/groom roads to facilitate snowcoach access would continue to: 1) increase wildlife use of packed roads and energetic benefits associated with such use causing significant alterations to natural processes; 2) artificially and unnaturally impact bison population dynamics and distribution, movement, and habitat use patterns; 3) facilitate bison access to alternative wintering sites including sites outside of the park where bison will continue to be killed; 4) cause the deterioration of the survival habitat within the fragile geothermal areas potentially leading to a catastrophic collapse of the bison population and significant ecological harm; and 5) adversely impact other wildlife species including elk, moose, mule deer, wolves, grizzly bears, and lynx by artificially altering distribution, movement, and habitat use patterns, and unnaturally disrupting predator/prey dynamics.

The NPS has, thus far, failed to disclose the relevant data, conduct the required analyses, or make the tough decisions that it is mandated to do. Though the SEIS provided an opportunity for the NPS to correct many of its blatant deficiencies contained in the DEIS, FEIS, and ROD, it has elected instead to continue its ostrich-like approach to the road packing/grooming issue. Sticking its agency head in the sand, however, will not make the issue or evidence disappear. Ignoring the substantive data compiled by Dr. Mary Meagher and others while embracing deficient results of studies conducted by others is indicative of an agency attempting to avoid a significant and controversial issue. The NPS could have corrected this deficiency in the SEIS, but, not surprisingly failed to do so. Similarly, the SEIS should have provided an extensive analysis of the impact of snowcoach access on wildlife (an analysis that was woefully inadequate in the DEIS and FEIS). In particular, how will wildlife, particularly bison, use of the packed road system change in response to a snowcoach only access policy and what are the implications (i.e., ecological, energetic, biological, physiological) of such changes? Because of its unwillingness to address the road packing/grooming issue, the NPS now faces the prospect of additional litigation and yet another SEIS in order to fully and comprehensively evaluate the direct, indirect, and cumulative impacts associated with road packing/grooming and wildlife, particularly bison, use of

such travelways.

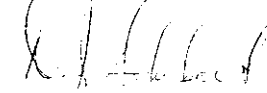
My clients' interest in restoring and protecting park wildlife, air quality, natural quiet, and natural regulatory process in the parks is not an idealistic philosophy, it's the law. There is no room for interpretation, no mitigation, no half-way in implementing the law -- either the NPS fully protects the parks and their wildlife or it doesn't. It's also not a question of balancing wildlife protection with public use as there is no law which requires that snowmobiles or snowcoaches be provided access into the parks, that roads be packed to facilitate such access, or that the public must be allowed to observe Old Faithful or Yellowstone's Grand Canyon in the winter.

Complying with the law and restoring naturalness to the parks by prohibiting oversnow motorized access and road packing/grooming would provide maximal protection and benefits to park wildlife, reduce winter air quality impacts to minimal levels, reestablish the ecological integrity of the parks, redistribute park wildlife in a more natural pattern, redefine the concept of natural quiet, and provide a much needed break for park wildlife from the impacts of excessive public use. While some would argue that restoring naturalness is akin to closing the parks to public use during winter, this is simply not true. Public use could still occur, but the type of use, number of users, location of use, and duration of use would be significantly reduced. Such restrictions are well within the authority of the NPS and, indeed, are required when public use is causing an impairment to, or disturbance of, park wildlife, resources, or values.

National parks were intended to be unique and significant properties within the public domain where natural processes would predominate and where current and future human generations could experience a landscape molded by nature and largely unchanged from more primitive times.

Thank you for the opportunity to submit these comments.

Sincerely,



D.J. Schubert  
Wildlife Biologist

#### Attachments

cc: Ms. Gale Norton, Secretary of the Interior  
Mr. Steven Williams, Director, U.S. Fish and Wildlife Service  
Mr. Howard Crystal, Meyer & Glitzenstein



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Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, WY 83012

Tuesday, May 28, 2002

Re: Winter Use Plans Draft Supplemental Environmental Impact Statement

Dear Park Service,

I am submitting these comments on behalf of Sierra Club. The Sierra Club has over 700,000 members. Our mission statement is as follows:

- Explore, enjoy, and protect the wild places of the earth.
- Practice and promote the responsible use of the earth's ecosystems and resources.
- Educate and enlist humanity to protect and restore the quality of the natural and human environment.
- Use all lawful means to carry out these objectives.

The Sierra Club wishes to reaffirm the previous decision on *Winter Use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr. Parkway* currently in place and documented by a record of decision published in November 2000. The Sierra Club reaffirms the original decision, 1a, following the original timetable. The Sierra Club opposes any delay in phasing out snowmobiles because of the impacts on visitors and wildlife.

The Sierra Club also wishes to note that the current process has been a waste of taxpayer money (\$2.4 million) as more than 65,000 comments were submitted previously and not only were they supportive of the record of decision published in November 2000, the scientific data supporting that decision was overwhelming.

The Sierra Club believes that use of our national parks should be so regulated as to preserve them unimpaired for the enjoyment of present and future generations, and that preservation has clear priority. Concerning impairment, we believe that the statement of national park

purpose made in 1865 by Frederick Law Olmsted is still valid, and should be rigorously heeded in the great national parks and monuments. That statement is as follows: "The first point to be kept in mind then is the preservation and maintenance as exactly as possible of the natural scenery; the restriction, that is to say, within the narrowest limits consistent with the necessary accommodation of visitors, of all artificial constructions and the prevention of all constructions markedly inharmonious with the scenery or which would unnecessarily obscure, distort, or detract from the dignity of the scenery."

#### Legal Framework

There are several important laws that establish the mandates of the National Park Service. These will be immediately reviewed.

The Organic Act of 1916 (16 USC 1, 2-4) and the General Authorities Act (16 USC 1a-1 through 1a-8) establish the basic mandate of the National Park Service:

"The Service thus established shall promote and regulate the use of the Federal areas known as National Parks...by such means and measures as to conform to the fundamental purposes of the said Parks...which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The General Authorities Act, amended by the Redwood Act (March 27, 1978, P.L. 95-250, 92 Stat. 163, 16 USC 1a-1), affirms the basic tenets of the Organic Act and provides additional guidance on national park system management:

"The authorization of activities shall be construed, and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established..."

Senate Report No. 95-528 on S. 1976, pg. 7, states that under the Redwood amendment:

"The Secretary of the Interior has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 Act to take whatever actions and seek whatever relief as will safeguard the units of the National Park System."

The Clean Air Act weighs in on air quality on federal lands. Because one of the primary issues about snowmobiles is that of air quality, the Clean Air Act is a primary focus in both the FEIS and in the more recent SEIS. Page 6 of the SEIS, Volume 1 states, the Clean Air Act "provides both for the prevention of significant deterioration of areas where air is cleaner than national ambient air quality standards, and for an affirmative responsibility by the federal land manager to protect air quality related values, including visibility. The Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act are intended, among other things, to preserve, protect, and enhance the air quality in national parks. The legislative history of the PSD provision indicates that federal land managers are to assume an aggressive role in protecting the air quality values of land areas under his jurisdiction and to err on the side of protecting the air quality-related values for future generations. The Act also requires

the prevention of any future impairment and the remedying of any existing impairment in Class I federal areas, which includes Yellowstone and Grand Teton National Parks."

It is these laws and Sierra Club conservation policies that form the basis of the following comments.

#### Comments

The acronym "GYA" stands for "Greater Yellowstone Area" and is comprised of Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller Parkway.

The current SEIS describes five major issues as important to evaluation and disclosing impacts in the FEIS of November 2000. They are:

- Visitor Use and Access;
- Visitor Experience;
- Human Health and Safety;
- Social and Economic Issues; and
- Natural Resources

To this list the Sierra Club will add another issue of importance, noise and natural quiet.

#### Noise and Natural Quiet

The Sierra Club supports the establishment of appropriate noise standards and comprehensive baseline sound-level monitoring and sound-source inventories of all protected areas. This includes continual assessment of noise from all human-generated sources and incorporation of public comments about noise impacts.

The sounds and silences of nature are among the intrinsic elements that combine to form the natural environment. Natural sounds amidst intervals of stillness are inherent components of the "scenery and the natural and historic objects and the wildlife" within National Monuments and units of the National Park System and National Wilderness Preservation System.

Natural quiet is the extended opportunity to experience only natural sounds amid periods of deepest silence. The quiet to be preserved or restored is as defined by the National Park Service as "the quiet at the lower end of the ambient sound level range that occurs regularly between wind gusts, animal sounds, etc., not just the average sound level." As the Park Service explains, "Lulls in the wind or interludes between animal sounds create intervals where the quiet of a sylvan setting is quite striking. In considering natural quiet as a resource, the ability to hear clearly the delicate and quieter intermittent sounds of nature, the ability to experience interludes of extreme quiet for their own sake, and the opportunity to do so for extended periods of time [are] what natural quiet is all about."

Many of these protected areas are vast, open places of astonishing beauty and wildness. Each protected area has a distinct and powerful aura, fully dependent upon the tenuous natural

sounds and natural quiet. As such, these areas afford unique opportunities for undistracted respite, solitude, contemplative recreation, inspiration, and education. Further, these units also provide scarce refuge and undisturbed natural habitat for animals. Artificial, human-generated noise can disturb some sensitive animal activities. Therefore, noise from snowmobiles and air tour overflights that disturb the peace are not normally appropriate in protected areas.

#### Wildlife and Natural Resources

The key to wildlife and native plant conservation is the continued existence of diverse natural ecosystems and the preservation of native biodiversity. The Sierra Club is committed to maintaining the world's remaining natural ecosystems, and, where feasible, to the restoration and rehabilitation of degraded ecosystems. Wildlife, plants, and their ecosystems have value in their own right, as well as value to humans and to the health of the biosphere.

NPS regulation 36 CFR 2.18 prohibits snowmobile use except where designated and only when use is consistent with the park's natural, cultural, scenic and aesthetic values and will not disturb wildlife or damage park resources. Snowmobiles inherently are an inconsistent use. Disturbance is defined in the SEIS as "to interfere with, or destroy the tranquility or composure of wildlife." (SEIS, p.116)

Ungulates rely on restricted winter ranges in which food and cover may be limited. Episodes of winter stress, low forage availability, and declining physiological conditions lead to increases in mortality. Competition is particularly severe in winter. (SEIS, p. 120) Thermal areas with snow-free vegetation or shallow snow are very important winter habitats for elk along the Madison, Firehole, and Gibbon Rivers. Ungulates function at an energy deficit during winter because snow reduces forage availability, affects an animal's ability to escape predators, and increases energy costs at a period of time when the nutritional value of winter forage is low." (SEIS p. 123)

Many of the groomed roadways in Yellowstone National Park bisect ungulate winter range. Interactions between elk, bison, and oversnow motorized vehicles are common. Rangers were asked to provide narrative accounts on their experiences dealing with oversnow motorized use and wildlife in YNP. "Of the nine rangers providing written accounts, all emphasized the frequent, often daily, occurrence of conflicts among ungulates (primarily bison) and oversnow motorized use, particularly snowmobiles. The most commonly cited problem involved snowmobilers unsafely passing bison...Rangers noted that these and other unsafe and harassing behaviors occur despite the availability of safety information that includes recommendation for interacting with animals on the roadway. They attributed these behaviors largely to inexperienced snowmobilers and snowmobilers who lack the patience to wait for animals to cross or exit the roadway." (SEIS p. 116-7)

Wildlife species face extreme challenges in the severe winter environment of the GYA. This makes the refuges of winter habitat profoundly important. The effects of human activities, when superimposed on these winter ranges, cannot be overstated. Winter recreation can harm wildlife.

**Visitor Experience**

Many visitors feel snowmobiles dominate their visit to the Parks. This causes many to stay away, negatively impacting the pool of people visiting the Parks. Enjoyment of park resources and values by the people of the United States are part of the fundamental purpose of all parks. While the Park Service is committed to providing appropriate and quality opportunities for their visitors, many forms of recreation enjoyed by the public do not require a national park setting and are more appropriate in other areas.

The Service should therefore encourage visitor activities that:

- Are appropriate to the purposes for which the park was established
- Are inspiration, educational, or healthful and otherwise appropriate to the park environment;
- Will foster an understanding of, and appreciation for, park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and
- Can be sustained without causing unacceptable impacts to park resources or values.

Activities that impact the safety and enjoyment of all users in the GYA should not be promoted or allowed. The Park Service should not allow visitors to conduct activities that:

- Would impair park resources or values;
- Create an unsafe or unhealthful environment for other visitors or employees;
- Are contrary to the purposes for which the park was established, or
- Unreasonably interfere with: the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic or commemorative locations within the park;..."

(NPS Management Policies of 2001, at 8.2)

The mode of access to the three-Parks is a function of visitor preference for a certain type of travel experience, unrelated to the intrinsic values of the parks. *...Under NPS policies, visitor experience is more associated with the quality of resources and values in the park setting, and less associated with the mode of transport used to access them.*" (p. 252)

Page 126 of the SEIS states "An important part of the mission of the NPS is to preserve or restore the natural soundscapes associated with units of the national park system. The natural soundscapes are the unimpacted sound of nature, and are among the intrinsic elements of the environment that are associated both with the purpose of a park and with its natural ecological functioning."

The SEIS goes on to say "Natural sounds and tranquility are major resources of many national parks and are valued by visitors. Increasingly, even parks that appear as they did in historical context do not sound like they once did. Natural sounds are being masked or obscured by a wide variety of human activities. NPS policy is to facilitate, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape

resource in a condition unimpaired by inappropriate noise sources. Every visitor who so desires should have the opportunity enjoy natural soundscapes and to hear the sounds of nature without impairment." (p.127)

**Human Health and Safety**

The Sierra Club favors effective and efficient enforcement of protective laws and regulations. Agencies charged with enforcement should seek and be given sufficient resources to carry out this mandate.

Under the 1916 Organic Act and the Clean Air Act the National Park Service has the responsibility to protect air quality. "The Service will assume an aggressive role in promoting and pursuing measures to protect [park] values from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Service will err on the side of protecting air quality and related values for future generations." (NPS Management Policies of 2001, at 4.7.1)

Extensive discussion on public health and safety related to winter use was well covered in the FEIS, pages 123-139.

In their cover letter of 4/23/02 regarding snowmobiles in Yellowstone National Park, the Environmental Protection Agency stated "the assessment of impacts in the DSEIS and FEIS is supported by an extremely thorough and credible body of human health, environmental, and wildlife science, much of which is site-specific to the Yellowstone ecosystem. NPS, academic and agency researchers have actively studied the impacts of snowmobile use for over 10 years in these Parks. The Yellowstone ecosystem has the benefit of more peer-reviewed scientific research on the effects of motorized winter recreation than any other place on earth."

The EPA goes on to say that alternative 1a of the SEIS is the only choice that does NOT "threaten to exceed National or Montana Ambient Air Quality Standards for carbon monoxide in the first year of implementation (2002-2003)" and that "alternatives 1b, 2 and 3 would likely result in noncompliance with air quality standards and that air quality could negatively impact human health."

Air monitoring near the West Entrance of YNP has registered significant levels of carbon monoxide, particulates, nitrates of oxides, hydrocarbons, benzene, formaldehyde, and other by-products of the internal combustion engines. Concentrations of these pollutants increase during periods of high visitation and/or poor air movement. There are frequent complaints by employees of nausea, dizziness, headaches, sore throats, eye irritation, light-headedness, and lethargy.(SEIS, p. 113) Due to these complaints and exposure to known carcinogens such as benzene and formaldehyde, park rangers working at the West Yellowstone entrance to the Park were issued respirators during the winter of 2001-2002.

Alternative 1a and 1b state: "The reduction in emissions and sound under this alternative would result in direct major beneficial improvement to the experiences of park visitors." (p.258)

In the winter of 2001-2002, the largest number of citations ever recorded in one season were written. A total of 338 citations were issued, occurring mostly in the West Yellowstone to Old Faithful corridor. Most of the citations were for speeding, careless driving, racing, driving without a license and off-road travel. And there was an increase in the number of incidents with wildlife. The Billings Gazette reported Deputy Chief Ranger Mona Divinc as saying "There was some impatience on the part of some snowmobilers coming too close to bison." Clearly this is a serious safety problem.

#### Visitor Use and Access

The Sierra Club supports the use of snowcoaches as the sole mode of recreational travel on park roads in winter. These vehicles hold 10-15 people and provide opportunities for on-board education by drivers, as well as sharing among families, friends and fellow visitors. Snowcoach routes and timing should be synchronized like municipal transit systems to allow individual trip planning and quiet periods for exploring between stops. A transportation alternative which fosters community and education among park visitors while allowing for appreciation of the natural winter state is the most sensible option for these sensitive and unique areas.

Similar transportation alternatives are in place, or will soon be in place, in Denali, Grand Canyon, Zion and Yosemite National Parks. The NPS should be a leader in promoting clean, quiet and affordable modes of group transportation which are protective of the natural qualities of the parks. Yellowstone is a natural place to look next for expansion of the alternative transportation program already taking place in the Park Service.

Affordable access is a cornerstone of our national park system. Winter visitation to Yellowstone and Grand Teton National Parks and the John D. Rockefeller Parkway, is by its nature, more costly than summer travel. Comparing modes of transportation used in accessing Yellowstone National Park reveals a price difference for a family of four.

The total cost for a family of four (two children 12 or under) to **snowmobile** in Yellowstone National Park for one day costs \$340. The breakdown of price is as follows:

\$218/day	for two double sleds (child rides on back)
\$68	(\$17 each for full suit times 4)
\$24	(\$12/sled for insurance)
<u>\$30</u>	<u>(\$15/sled for entry into the Park, good for one week)</u>
\$340	total for family of 4 for one day

A **snowcoach** tour for a family of four (two children 12 or under) is \$288 from West Yellowstone to Old Faithful. The breakdown of price is as follows:

\$159	(\$79.50 per adult person)
\$109	(\$54.50 per child)

<u>\$20</u>	<u>(Family pass - entry into Park, good for one week)</u>
\$288	total for family of 4 for one day

This is a difference of \$52 per family of four. The cost savings for the family becomes even greater if they ride the snowcoach into the Park and use Park lodging for their overnight stay rather than using snowmobiles for entry each day. If snowcoaches were used exclusively within the Park the cost of snowcoaches would decrease further because of savings due to standardization.

Therefore, access to the GYA by snowcoach is less costly affording more people the opportunity to visit the national parks than by snowmobile use.

There is room to make snowcoach trips even more affordable. Funds to do so may come from savings accrued from altered winter management such as closed fuel dumps and less frequent grooming, the fee user program or other park budget appropriations, or federal and state grants which support cleaner transportation systems.

#### Social and Economic Issues

In the five-county region of the Greater Yellowstone Area, the direct, indirect, and induced expenditures generated by nonresidents visiting the parks in the winter months are estimated at about \$63 million. Based on a 2000-2001 Wyoming Snowmobile Survey, the state of Wyoming concluded that there could be a loss of up to 938 jobs, \$11.8 million in labor income, and \$1.3 million in government revenue in the state. The economy of the five-county GYA area has an annual output of \$5.7 billion. (Minnesota IMPLAN Group, County-level data 1996).

Furthermore, the National Park Service has stated that these numbers significantly overstate potential impacts. (p. 93, Winter Use Plans 2002, Vol. 1)

#### Conclusion

The Sierra Club appreciates the efforts of the National Park Service. It is unfortunate that time was spent on the duplication of a process that had already been completed and formalized by a record of decision. However, we must move forward.

Let me re-state that the Sierra Club wishes to reaffirm the previous decision on *Winter Use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr. Parkway* currently in place and documented by a record of decision published in November 2000. The Sierra Club reaffirms the original decision, 1a, following the original timetable and opposes any delay in phasing out snowmobiles because of the impacts on visitors and wildlife.

Thank you for your time and effort.

Yours truly,





SIERRA CLUB • LOMA PILITA CHAPTER  
**GUADALUPE REGIONAL GROUP**

Winter Use Draft SEIS Comments,  
Grand Teton and Yellowstone National Parks  
P.O. Box 352  
Moose, WY 83002

Apr 27, 2002

Ladies and Gentlemen in Charge,

The Undersigned has been asked to enter our comments on the SEIS for the Winter Use Plan.

The use of motor driven snowmobiles is inherently incompatible with recreation enjoyed by other visitors. EPA - type air and noise pollution standards may be applicable to work environments and other daily activities, but not where people travel distances to seek nature, silence, and fresh air. In addition to noise, odors, and health hazards from emissions that are hard to control, motor vehicles on snow pose a safety hazard to passers-by and animals on their trails. The only acceptable use of snowmobiles is in case of emergencies arising from accidents from other causes that cannot be eliminated.

We hope that the trust of the people vested in the National Park Service will take precedence over the vested interests of a minority.

Respectfully,

Werner Barasch  
Legislative Liaison  
Sierra Club  
Guadalupe Regional Group  
23049 Santa Cruz Highway  
Los Gatos, CA 95033



Group Office:  
1922 The Alameda, Room 213  
San Jose, CA 95126  
408 554-0442

Recycled Paper



"John Schmidt"  
<jschmidt@srv.net>  
05/23/2002 10:18 PM  
CST

To: <grte\_winter\_use\_seis@nps.gov>  
cc:  
Subject: Comments on Winter Use Draft SEIS

Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012

Re: Winter Use Draft SEIS

Dear Park Service folks,

On behalf of the more than three hundred members of the Eastern Idaho Group of the Sierra Club I wish to submit the following comments on the Winter Use Draft SEIS:

I'm not sure what more can be said about a topic that has been studied for more than a decade. Yet the more we study it, the more clear it becomes that the Park Service must heed the best science, must honor the laws of the land, must honor its own National Parks charter and last but not least, must honor the vast public opinion that wants Yellowstone National Park to be free from the bane of snowmobiles!

The snowmobile industry has attempted, time after time, to derail Park Service efforts to address the growing problem in Yellowstone of snowmobiles. They are pushing four-stroke engines that are being touted as "cleaner", but that does not mean that they are clean. And while they are being touted as "quieter", they are not quiet. Indeed, there is absolutely no new evidence that warrants changing your decision to phase out snowmobile use. In fact, the SEIS demonstrates again that your original decision was sound. The SEIS shows that continued snowmobile use in the parks will result in more noise, dirtier air, and less protection for wildlife than a transition to snowcoach access.

Only by choosing Alternative 1A in the SEIS can the Park Service adequately fulfill its duty to this remarkable place. The Park Service must act to uphold its previous decision to phase out snowmobiles and replace them with the much more reasonable alternative that is to be found with snowcoaches. Snowmobile presence in the parks is totally in violation of National Park Service (NPS) policies regarding both air quality and noise. I do not see how the NPS can justify allowing them to remain, fouling the air with their emissions and stripping away the peace and tranquility that a visitor to Yellowstone should be allowed to experience.

The other alternatives presented fail to address the long term negative impacts posed by snowmobiles on the wildlife and natural resources in the Greater Yellowstone Area (GYA).

I will further detail my concerns in the following sections:

**Carrying Capacity**

The NPS is mandated by the NPS Organic Act (16 USC 1, 2-4) and the General Authorities Act (16 USC 1a-8) "to protect park resources and provide for the enjoyment of those resources in a manner that leaves them unimpaired for future generations." Without knowing the carrying capacity of these parks, the NPS can not claim to be meeting the intent of these Acts. A carrying capacity study must be done to ensure that natural resources and wildlife are protected and not compromised by current levels of winter use.

Furthermore, given the nature of snowmobiles, with their filthy exhaust and their un-burnt fuel and oil, they can not be leaving these Parks "unimpaired for future generations". Those emissions are going somewhere. What kinds of



damages are they causing that we have yet to become aware of?

#### Visitor Experience

Visitor experience data collected in the Park traditionally has centered on interviewing snowmobilers. The truth is, there are hordes of us who will never step foot into the Park under current winter-use conditions so that data is skewed from the start. It is not a stretch to assume that snowmobile users would not be as concerned about air-quality and noise levels as perhaps someone more in tune with the natural Park setting that they came hoping to find, a cleaner, quieter Park. As it is, those folks who may wish to visit the park to find those conditions are sorely disappointed and are forced to seek their solitude elsewhere due to the current situation in YNP and GTNP.

The NPS must not rely on the results of these questionable surveys and should assign more consequence to the other critical areas of the SEIS, those being air quality, noise, natural resources, and human health and safety.

#### Air Quality

YNP is a Class I quality air shed. Air quality is legally addressed in the GYA under the Clean Air Act, the Organic Act of 1916, and NPS Management Policy. As documented below, the excessive pollution of two-stroke engines is clearly prohibited under each of these laws or policies. The use of two-stroke engines in national parks, in the form of snowmobiles, is extremely questionable and is being examined by the NPS and the General Accounting Office. Four-stroke engines, while being touted as "cleaner", still are not "clean". And while they are being touted as "quieter", they are not "quiet".

According to National Park Service Policy 4:17, NPS Policy seeks to perpetuate the best possible air quality in parks "because of its critical importance to visitor enjoyment, human health, scenic vistas, and the preservation of natural systems and cultural resources." NPS Management Policies further states, "[I]n cases of doubt as to the impacts of existing or potential air pollution on park resources, the Park Service will err on the side of protecting air quality and related values for future generations." "These policies require managers to assume an aggressive role in promoting and pursuing measures to safeguard air quality and related values from the adverse impacts of air pollution." (NPS, 1999)

The NPS is mandated through both its own 1916 Organic Act (16 U.S.C. 1), the Clean Air Act (42 U.S.C. 7401 et seq.) and Executive Order 12088, as amended, to protect air quality in National Parks. This Executive Order requires the head of each executive agency to ensure that all necessary actions are taken for the prevention, control, and abatement of environmental pollution (at 1-101) to submit a plan for the control of environmental pollution to the GMB annually, and to "ensure that sufficient funds for compliance with applicable pollution control standards are requested in the agency budget." (Id at 1-501.)

Section 176 of the Clean Air Act states, "No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an [state] implementation plan... [T]he assurance of conformity to such a plan shall be an affirmative responsibility of the head of such department, agency or instrumentality." Specifically addressing the NPS, the Clean Air Act states "the NPS, as a federal land manager, has an affirmative responsibility to protect air quality related values, including visibility, from the adverse effects of air pollution in areas that are designated as Class I." There are 48 Class I areas that are part of the NPS. Congress intended that these areas be afforded the greatest degree of air quality protection and specified that only very small amounts of air quality deterioration from new or modified major stationary sources be permitted. One of the purposes of this "prevention of Significant Deterioration (PSD)" program is "to preserve, protect, and enhance the air

quality in national parks." (42 U.S.C. 7401 et seq.) Additionally, any action taken by the NPS, a Federal entity, must conform to state plans to achieve and maintain national air quality standards.

Clearly, federal actions must not cause or contribute to new violations, increase the frequency or severity of existing violations, interfere with timely attainment of maintenance of any standard, delay emission reduction milestones, or contradict State Implementation Plan requirements.

Currently, there are no federal laws regulating snowmobile exhaust. Even four-stroke emissions are significantly higher than present-day automobiles and can concentrate in areas having cold and stable air. Furthermore snowmobiles dump unburned fuel into YNP and GTNP snow packs every winter

By allowing snowmobiles to continue use in the GYA, the Park service puts at risk our Class I air shed. Mike Finley, former YNP Superintendent, states in an article in the Jackson Hole News dated October 27, 1999, "Yellowstone's air must be kept clean." He goes on to say that, "We are a class one area, like wilderness. Snowmobiles are not allowed in wilderness." Later in the article, "Under park management policies, all national parks must protect clean air. Mr. Finley reiterates the policy mentioned earlier, "In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Park Service will err on the side of protecting air quality and related values for future generations." He goes on to state in an opinion article he wrote for the Jackson Hole Guide on November 10, 1999 on why the information on the Air Resources Division of the National Park Service report is important, "The first reason involves human health. These new studies give us reason to wonder if park visitors' health may be affected by high levels of emissions during their trip into Yellowstone, not to mention the quality of experience from the visual effects and noise." He wrote, "These studies indicate that we are not meeting the intent of these laws." The laws in question are the 1916 Organic Act (16 U.S.C. 1), the Clean Air Act (42 U.S.C. 7401 et seq.) and Executive Order 12088.

Because of (1) increased snowmobile use, (2) the amount of harmful pollutants, and (3) because snowmobiles are unregulated, the Park Service must mitigate or eliminate impacts to air quality. Converting winter recreational transportation in YNP and GTNP and the JDRP would accomplish the desired conditions the park service seeks in this planning process, those being air quality, noise reduction and reduction in vehicle numbers.

#### Noise Pollution

In an editorial written in the Salt Lake City Tribune on Tuesday, November 16, 1999, it states, "Preserving a national park's pristine and quiet nature by banning snowmobiles is not a revolutionary idea; the park service already does it in Glacier and Yosemite. Given three decades of evidence of the disturbance these machines have caused, there would seem to be even more justification to ban them at Yellowstone. Natural Quiet, "An important part of the mission of the NPS is to preserve or restore the natural soundscapes associated with national parks. The natural soundscapes (also called natural quiet) are unimpacted sounds of nature, and are among the intrinsic elements that combine to form the environment of our natural parks." On the paragraph on Natural Quiet on page 126 of the SEIS, it states, "Natural sounds are slowly and inexorably disappearing."

Parks and wildernesses offer a variety of unique, pristine sounds not found in most urban or suburban environments. They also offer a complete absence of sounds that are found in such environments. Together, these two conditions provide a very special dimension to a park experience. Quiet itself, in the absence of any discernible source, especially man-made, is an important element of the feeling of solitude. Quiet also affords visitors an opportunity to hear faint or very distant sounds such as animal activity, waterfalls, etc. Such an experience provides an important perspective on the vastness of the

environment in which the visitor is located, often beyond the visual boundaries determined by trees, terrain, and the like. In considering natural quiet as a resource, the ability to hear clearly the delicate and quieter intermittent sounds of nature, the ability to experience interludes of extreme quiet for their own sake, and the opportunity to do so for extended periods of time is what natural quiet is all about.

The preceding paragraph is from the conclusion of a 1995 National Park Service report on the effects of Aircraft overflights on the NPS. This report also refers, in section 3.3 of its Conclusion, to five important facts that are to be considered when dealing with natural quiet:

- 1) Natural quiet is a resource for preservation within the NPS mandate.
- 2) The human auditory system is an excellent mechanism for determining the presence or absence of natural quiet. No available electronic device can duplicate human hearing for identifying audible sounds produced by non-natural sources.
- 3) The difficulty of preserving natural quiet is directly related to how quiet it is.
- 4) Humans are not always aware of sounds that are audible.
- 5) Park settings can provide levels of natural quiet so quiet that there is no sound to be heard except that generated by the listener - the sounds of walking, breathing, heart pumping, and blood flowing.

Section 3.3 of the same report goes on to say "The quiet afforded in park settings is virtually in a range of its own, well below that which we experience in our normal daily routine." Section 3.4 of the report states "the quiet to be preserved (and restored) is the quiet at the lower end of the ambient sound level range that occurs regularly between wind gusts, animal sounds, etc.... not just the average sound level."

The NPS Management Policies of 1988 (chapter 1, pages 3-4) state "The individual parks ... have intangible qualities such as natural quiet, solitude, space, scenery, a sense of history, sounds of nature and clear night skies that have received congressional recognition and are important components of people's enjoyment of parks. These NPS Management Policies use the terms resources and values to mean the full spectrum of tangible and intangible attributes for which parks have been established and are being managed.

These NPS Management Policies recognize that all parks are complex mixtures of values and resources, each with its own unique qualities and purposes, each requiring specific treatment in the development and implementation of management strategies and operational plans. The word 'unimpaired' plays an important role in the conservation of resources and providing for present-day public enjoyment. Both physical resources, such as scenic vistas and solitude, may be impaired. It is NPS policy to treat potential impairments in the same manner as known impairments."

The NPS Management Policies (chapter 4, page 17) goes on to say "The National Park Service will strive to preserve the natural quiet and the natural sounds associated with the physical and biological resources of the parks (for example the sounds of the wind in the trees or of waves breaking on the shore, the howl of the wolf, or the call of the loon). Activities causing excessive or unnecessary unnatural sounds in and adjacent to parks... will be monitored and action will be taken to prevent or minimize unnatural sounds that adversely affect park resources or values or visitors' enjoyment of them."

Snowmobile use has led to inescapable noise throughout YNP, GTNP and JDRP. The effect of this noise is stress to winter-worn wildlife and, to other visitors, the loss of the stillness, solitude and natural quiet that they came to enjoy.

Any alternative that continues to allow snowmobiles in Yellowstone will fail to mitigate the problems of noise in both YNP and GTNP and, if implemented, would appear to be in violation of the Park Services' own Management Policies

as they apply towards noise.

A finer point of noise measurement must be considered here as well. That is that when dealing with decibels, two sources emitting an equal sound level, say 70dB for example, will produce a combined 73dB output. Noise levels are measured on a logarithmic scale such that for every 3dB rise the sound energy is doubled. Thus the noise level given off by a pair of snowmobiles will actually be double that of the 70dB level. It is hard to fathom how the Park Service would be in compliance with its own policies (referred to in the preceding paragraphs) under these conditions.

Only a plan that places a reliance on mass-transit systems featuring quieter snow coaches, will effectively deal with the noise that has been allowed to spread throughout these parks.

#### Conclusion

In conclusion, I join with literally millions of Americans in endorsing Alternative 1A. I urge the National Park Service to stick to its original decision and proceed with its plan to transition over to mass-transportation in Yellowstone National Park.

Thank you for the opportunity to comment on the Winter Use Plan SEIS.

Sincerely,

John W. Schmidt, Chair  
Eastern Idaho Group, Sierra Club  
8862 Maple Grove Lane  
Pocatello, Idaho 83201

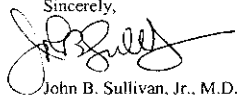
John B. Sullivan, Jr., M.D.  
6091 East Finisterra Drive  
Tucson, Arizona 85750

May 20, 2002

Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
PO Box 352  
Moose, Wyoming 83012-0352

I am opposed to allowing continued use of snowmobiles in Yellowstone National Park because of pollution, noise, and wildlife disruption. I favor Alternative 1-A in the Supplemental Winter Use Study. I frequently visit the national parks in the west and have not visited Yellowstone National Park in the winter because of the heavy snowmobile use. Also, as a physician I am aware that national park employees have suffered adverse health effects secondary to the pollutants of these snowmobiles. Enclosed is a letter that I sent to the Superintendent of the National Park Service and my congressman expressing my concern about health effects of park employees. I support a ban of snowmobiles from the park. Thank you.

Sincerely,



John B. Sullivan, Jr., M.D.  
JBS/smh

Enclosure

THE UNIVERSITY  
PHYSICIANS  
Toxic Exposures Clinic

THE UNIVERSITY  
PHYSICIANS  
Toxic Exposures Clinic

March 15, 2002

Susanne Lewis, Superintendent  
Yellowstone National Park  
PO Box 168  
Yellowstone National Park, WY 82190

Dear Ms. Lewis:

I am in favor of a ban on snowmobile use in Yellowstone National Park. My position on this matter derives from a desire to protect park employee health and preserve the overall serenity of the park. As a physician and Director of the Toxic Exposures Clinic, University of Arizona Health Sciences Center, I have treated many individuals who have respiratory illnesses and asthma caused by pollutants such as those produced by snowmobile engines. Due to the nature of these pollutants, the continued use of snowmobiles jeopardizes the health of park employees forced to inhale exhaust.

Scientific studies have demonstrated that airborne particulates and other pollutants generated by internal combustion are associated with excess cardiovascular and respiratory illness and increased mortality (1-14). Scientific studies also link vehicle exhaust to asthma and other respiratory symptoms (15-18). Pollutants produced by snowmobiles cause both acute adverse respiratory effects and chronic effects especially if employees are forced to inhale those pollutants because of their duties (1,7,18). These pollutants consist of particulates that are of a respirable size that can reach deep into the lungs, nitrogen oxides, acid aerosols, and carbon monoxide, and are verified health risks (17,18). While dispersion in the air affects concentrations of these pollutants, the highest concentrations occur near their point sources and the next highest concentration of secondary pollutants occur at a distance from their sources. Confined spaces or semi-confined spaces of workplaces can concentrate these pollutants (15,16).

Due to the fact that large numbers of snowmobiles are sources of large quantities of respiratory pollutants and toxins, it is not medically reasonable to allow your employees to be continually exposed, nor is it wise to require respirator use when the pollutant source can be removed. Banning snowmobile use from Yellowstone National Park, particularly in the West Yellowstone entrance appears to be a medical necessity for the health of some park employees. These types of pollutants cause acute inflammation of the lungs, eyes, headaches, and they can also exacerbate chronic respiratory problems such as asthma. They can also lead to asthma (17,18,20).

The American Thoracic Society considers adverse health effects of pollutants to include respiratory symptoms, decreased health-related quality of life, decrements in lung function, and detectable clinical effects (19).

1501 N. Campbell Avenue / Rm. 2302A / Tucson, Arizona 85724 / (520) 694-5110 / FAX (520) 694-2302  
In association with the Arizona Health Sciences Center at The University of Arizona

I am aware that there are other places nearby to snowmobile besides the interior of the park. Besides preventing health problems for your employees, the overall status of the wildlife and enjoyment of the park will be improved by banning snowmobiles. I am available to discuss this health issue with you in more depth.

Sincerely,



John B. Sullivan, Jr., M.D.  
Associate Dean for Clinical Affairs, College of Medicine  
Director, Toxic Exposures Clinic  
University of Arizona Health Sciences Center

cc: Senator John Kyl  
7315 N. Oracle Road, Suite 220  
Tucson, AZ 85704

Senator John McCain  
450 W. Paseo Redondo, Suite 200  
Tucson, Az 85701

Congressman Ed Pastor  
2432 E. Broadway Blvd.  
Tucson, AZ 85719

Congressman Jim Kolbe  
1661 N. Swan Road, Suite 112  
Tucson, AZ 85712

Congresswoman Barbara Cubin  
1114 Longworth House Office Building  
15 Independence Avenue, S.E.  
Washington, D.C. 20515

Jeff Bingaman  
703 Hart Senate Office Bldg.  
United States Senate  
Washington, D.C. 20510

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## THE WILDERNESS SOCIETY

May 29, 2002

Winter Use SEIS  
Planning Office  
Grand Teton National Park  
P.O. Box 352  
Moose, Wyoming 83012

RE: Comments on the Winter Use Draft Supplemental Environmental Impact Statement for Yellowstone and Grand Teton National Parks

To Whom It May Concern:

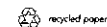
On behalf of The Wilderness Society and our 200,000 members across the country, we appreciate the opportunity to submit the following comments on the draft Supplemental Environmental Impact Statement regarding winter use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway. The attached comments also were sent to the National Park Service via email.

The Wilderness Society has a long tradition of working to protect our national park system and has been actively engaged in the issue of winter use in Yellowstone and Grand Teton National Parks for many years. Your decision regarding winter use in these parks will clearly set a precedent for National Park management for generations to come. The issue of proper winter use has been, and will continue to be, one of the highest conservation priorities for The Wilderness Society.

The Wilderness Society works to protect America's wilderness and wildlife and to develop a nationwide network of wild lands through public education, scientific analysis and advocacy. Our goal is to ensure that future generations will enjoy the clean air and water, wildlife, beauty and opportunities for recreation and renewal that pristine forests, rivers, deserts and mountains provide.

We want to commend the National Park Service (NPS) for the detailed and substantive analysis found in the DSEIS, FEIS and ROD. The decision to phase snowmobile use out of Yellowstone and Grand Teton National Parks was based on more than a decade of science, the legal mandate of the NPS to manage the parks unimpaired for the enjoyment of future generations, and the clear support from the American people during the numerous opportunities for public involvement.

NORTHERN ROCKIES REGIONAL OFFICE  
105 W. MAIN STREET, SUITE E, BOZEMAN, MT 59715  
(406) 586-1600 FAX (406) 586-4700



The analysis within the draft Supplemental Environmental Impact Statement supports the original decision set forth in the FEIS and finalized in the ROD. The DEIS concludes that phasing out snowmobile use provides the best protection for Yellowstone and Grand Teton National Parks. **The Wilderness Society fully supports and urges the NPS to move rapidly forward toward the implementation of Alternative 1a as outlined in the DSEIS.**

As the DEIS acknowledges, the NPS analysis of the local economic impacts associated with a change in the form of winter use in Yellowstone and Grand Teton National Parks made assumptions regarding the proportional relationship between visitor numbers and visitor expenditures. The economic analysis also lacked a thorough assessment of the economic benefits associated with the phase in of snowcoach use. By using the assumption regarding visitor expenditures and failing to look at the positive benefits of a public transportation system the NPS provides an incomplete vision of a successful transition from snowmobiles to snowcoaches.

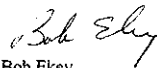
We have attached an economic analysis of the impacts associated with a change in the form of winter access in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway. We hope you will incorporate it into your final decision regarding winter access into these national treasures.

In addition to these comments, we are also submitting detailed comments with the Greater Yellowstone Coalition, National Parks Conservation Association, Natural Resource Defense Council, Bluewater Network, Sierra Club, Natural Trails and Water Coalition and others. Please consider both the attached comments and the additional submitted analysis as official comments from The Wilderness Society.

Respectfully,



Betsy Buffington  
Associate Regional Director  
Northern Rockies Office  
The Wilderness Society



Bob Ekey  
Regional Director  
Northern Rockies Office  
The Wilderness Society



## THE WILDERNESS SOCIETY

An Analysis by The Wilderness Society

### Economic Impacts Associated with a Change in Motorized Access to Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr. Parkway

The positive impacts of a change in motorized public access to Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr. Memorial Parkway (the Parks) during the winter season will likely outweigh any potential negative impacts of a transition to snowcoach use. The region's economic vitality depends on a healthy Yellowstone National Park. The shift from snowmobiles to snowcoaches and the resulting protection of the Parks will strengthen the economic forces responsible for the recent growth and development of local and regional economies. The major reasons for this include:

- *Strengthen and Diversify the Local and Regional Economies.* Currently, potential winter visitors are deterred by the noise and pollution generated by snowmobiles. The change in public access will attract new visitors to the Parks, which will diversify the demand for goods and services sold in gateway communities during the winter season.
- *Faster, Smoother Snowcoach Rides.* On routes that haven't been degraded by snowmobiles, snowcoaches offer a smooth, comfortable ride at speeds up to four times the current speed possible on routes shared with snowmobiles.
- *Visitors Will Spend More Time in Gateway Communities.* Seventy-four national parks have successfully implemented some form of public-transit program. One impact of these programs has been that while waiting for scheduled bus service, visitors spend more time and money shopping, dining in restaurants and buying other goods and services in gateway communities than they did in the past. There is every reason to expect a similar response when the transition is made to a public-transit system of access in Yellowstone and Grand Teton National Parks.
- *Spending in Gateway Communities Doesn't Track the Number of Visitors to the Parks.* Visitor spending in West Yellowstone during winter has increased each year since 1993 (adjusted for inflation), while the number of winter visitors to Yellowstone National Park through the west gate near the town of West Yellowstone has been on a declining trend. The false assumption that visitor numbers and spending move in fixed proportions overstates any potential negative impacts of the change in public access. The potential negative impacts of the change estimated by the Park Service assumes there is a fixed and proportional

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relationship between the number of winter visitors to the Parks and visitor expenditures in gateway communities. As the data for West Yellowstone shows, a decline in visitors to the Parks has not caused a reduction in visitor spending.

- *Worst-case Impacts Affect Less Than One Percent of the Local Economy's Economic Output or Employment.* Even if we accept the Park Service estimate of potential negative impacts, these impacts represent a 0.3 percent reduction in economic output for the local economy and a 0.5 percent reduction in employment.
- *The Change to a Public Transit System Applies Only to the Parks.* Winter visitors have ample opportunities for snowmobiling outside of the Parks. Public and private lands surrounding the Parks provide hundreds of miles of system trails available for snowmobile recreation.
- *There Will be Benefits.* Increased sales and jobs associated with the new transportation system will likely mitigate any reduction in sales or jobs associated with the change.

Decision-makers, stakeholders and other interested parties can take steps that will maximize the benefits of the change and minimize any potential negative impact. These steps include:

- *Develop a Coordinated Advertising Effort.* Park managers, concessionaires and state tourism boards could organize and implement an advertising campaign promoting the Parks in winter. Pooling and targeting existing advertising budgets would increase the effectiveness of the campaign and reach a larger market than would individual state or agency efforts. Approximately 96% of Park visitors do not visit in winter and represent a huge, untapped potential for new market for winter visitors.
- *Develop a Transportation Plan in Coordination with Local Governments.* Business owners, residents and local officials from gateway communities can provide important insights that will maximize the success of a transportation plan.
- *Apply for Funding.* Currently, the National Park Service has five public-transport demonstration projects that receive support from 20 different funding sources. Various federal programs exist that could potentially fund transportation planning and expanded snowcoach service. Opportunities exist for additional funding to help pay for the transition to snowcoaches.

#### Winter Visitors to the Parks and Tourism Expenditures in Gateway Communities

The National Park Service (NPS) decided to begin to phase-in a change in public access during the winter season in the Parks starting the winter of 2001-2002. The change will progressively reduce the use of snowmobiles in the Parks over the next two winters. By the winter of 2003-2004 snowcoaches will provide the only motorized, over-snow access in winter.

Some local business owners are concerned that changing the form of access will reduce the number of winter visitors to the Parks, thereby reducing visitor spending in gateway communities. Estimating the potential economic impacts of the change in access of gateway communities depends, in part, on understanding the relationship between the number of winter visitors and tourism expenditures. This section describes the available information on winter visitors to the Parks and visitor expenditures in gateway communities for insights into how a change in the number of visitors has affected visitor spending. The NPS collects detailed information on the number of visitors entering the Parks. The local city and country governments surrounding the Parks collect lodging or resort taxes that target visitor expenditures.

Charts 1, 2, and 3 [attached at the end of this document] show the number of winter visitors through the west, east and north gates of Yellowstone NP, respectively, and the resort and lodging tax revenues. These charts show that the number of winter visitors to the Parks and visitor expenditures in gateway communities do not change proportionally, or even move in the same direction. Hence, the data from the past decade do not support the conclusion that a change in access will lead to a reduction in the number of visitors to the Parks. In fact, sales and jobs might increase.

Charts 1, 2 and 3 also show the same trends during the winter visitor seasons<sup>1</sup> from 1992-93 through 1999-00 – a generally declining trend in number of visitors and a generally increasing trend in visitor expenditures, measured in constant year 2000 dollars. The west entrance, depicted in Chart 1, accounts for 48 percent of winter visitors to Yellowstone NP, with 90% of visitors traveling by snowmobile and 10% by snowcoach. Three percent of winter visitors enter the Park via the east entrance and 86% of these visitors travel by snowmobile and 14% enter the Park on skis.<sup>2</sup>

Chart 3 shows no apparent trend in visits or expenditures associated with the north entrance to Yellowstone National Park during 1993-2000<sup>3</sup>.

Teton County, Wyoming, which includes Grand Teton NP and the south entrance to Yellowstone doesn't have a lodging tax and so we were unable to compare visits through

<sup>1</sup> Winter visitors and expenditures measured during December 1 through March 31.

<sup>2</sup> Final EIS, pages 182-184.

<sup>3</sup> Winter visitors and tax revenue measured January 1-March 31.

the south entrance with visitor spending. Nineteen percent of winter visitors enter Yellowstone through the south entrance, 87% by snowmobile, 13% by snowcoach.

The charts illustrate two important points about the relationship between winter visitors to the Parks and tourism spending in gateway communities:

- The number of winter visitors and tourism expenditures do not move in concert. Charts 1 and 2 show declining trends in the number of winter visitors, but increasing visitor expenditures.
- The recent declining trend in winter visitors through the west and east entrance to Yellowstone did not negatively impact visitor spending. In fact spending increased even as the number of visitors declined.

Taken together, these points show that changes in the number of winter visitors to the Parks is not a good predictor of changes in visitor spending in gateway communities. An important reason for this lack of relationship between the number of Park visitors and visitor spending is that winter visitors engage in other activities besides visiting the Parks during their stay in gateway communities.

According to the FEIS, the average visitor to the Parks spends only one day of a multi-day snowmobiling visit on the 225 miles of snowmobile routes within the Parks.<sup>4</sup> They spend the majority of their visit snowmobiling on lands adjacent to the Parks that contain hundreds of miles of snowmobile trails. For example, Fremont County, Idaho that borders the Parks, has over 400 miles of snowmobile trails that are groomed on a regular basis.<sup>5</sup> West Yellowstone, Montana has the reputation as the “snowmobiling capital of the world,” according to the area’s tourism industry. Snowmobiles are street legal in town and snowmobile trails begin where streets end. Visitors can ride snowmobiles from their hotel, through town and onto trails that extend for hundreds of miles.<sup>6</sup>

Many winter visitors to the Parks currently ride outside the Park and this accounts for the fact that changes in visitor expenditures do not match changes in the numbers of visitors to the Parks. People stay in gateway communities but they spend only a portion of their visit in the Park.

#### Impacts of Changing the Form of Winter Access

The final EIS predicts that the change in the form of access to the Parks in winter will reduce the economic output and employment in the five-county Great Yellowstone Area (GYA). This analysis overstates the true impacts of the change because the underlying analysis assumes a proportional relationship between a change in the number of winter visitors to the Parks and the resulting change in visitor expenditures in gateway

communities. In fact, the Park Service acknowledge the limitations of their analysis and indicate in the FEIS that they found no fixed relationship between visitor spending and the number of visitors to the Parks:

*These estimates likely overstate the impacts on West Yellowstone. The impact projections assume that the change in the West Yellowstone winter economy is proportional to change in park visitation. There is considerable evidence that historical declines in winter park visitation through the West Entrance have not resulted in proportional declines in the local economy... This non-proportional relationship between park visitation and the local economy is probably due to extensive winter recreational opportunities near West Yellowstone, including 4000 miles of snowmobile trails outside YNP. The average visitor to West Yellowstone spends only one day of a multi-day trip snowmobiling in the Park (Final EIS, page 402)*

Placed in the context of the total number of visitors to the Parks and the size of the GYA economy, even the overestimated impacts represent a minor reduction in output and employment:

- According to the FEIS, winter visitors to YNP account for between 4 and 5 percent of the total number of visitors to the Park (p. 108)
- The estimated output and employment impacts of the change represent a 0.3 percent of the total economic output in the GYA and a 0.5 percent reduction in employment in this economy (p. 222)

According to the FEIS, even the worst-case overestimate of potential negative impacts will be short term. The estimated decline in economic output is less than the average annual rate of growth of visitor spending.<sup>7</sup> That is, the estimated average growth of visitor spending over one year will roughly match the estimated reduction in spending because of the change in motorized access. Possible reductions in sales and jobs associated with the change will be offset by increased sales and jobs associated with the general increasing trend in visitor spending. The NPS estimates do not include such likely positive impacts of the change.

The State of Wyoming estimates the changing public access during the winter season will generate negative impacts that slightly exceed the results reported in the FEIS. Wyoming’s analysis ignores the evidence that visitor expenditures in gateway communities and the number of visitors to the Parks do not move in concert. Wyoming’s analysis also ignores the fact that most visitors spend only a portion of their visit inside the Parks.

The EIS concludes that these and other assumptions associated with Wyoming’s analysis yield estimates that overstate the true impacts of the change in access. “Other things being equal, [Wyoming’s] assumptions may lead to overstating impacts by a factor of

<sup>7</sup> Final EIS, page 402.

<sup>4</sup> Final EIS, page 402, Table S-1 Summary of Alternatives.

<sup>5</sup> Final EIS, page 108.

<sup>6</sup> [www.westyellowstone.com](http://www.westyellowstone.com) and [www.yellowstonewebsites.com/snowmobiling.htm](http://www.yellowstonewebsites.com/snowmobiling.htm)



three or four<sup>8</sup>.” This conclusion seems reasonable in light of the evidence discussed above.

#### Historical Context for Estimating Impacts of the Change in Public Access

Visitor reactions to previous events affecting the winter use and summer recreation experiences in the Parks provide insights into the likely impacts of the change in public access. We describe the experiences below. These experiences generally support the conclusion that protecting the quality of the Parks’ natural resources will increase the Parks’ attractiveness and thus, increase the demand for goods and services sold by businesses in gateway communities.

**Snowmobile World Expo.** The snowmobile industry holds the Snowmobile World Expo in West Yellowstone toward the end of each winter season and up until three years ago, Expo visitors could ride Yellowstone’s snowmobile routes. Three years ago, for reasons unrelated to the Expo, Park managers shortened the Park’s winter season. The shorter winter season means Expo visitors could no longer access Yellowstone’s snowmobile trails. When Park managers announced the earlier closure of the winter season, a number of local businesses expressed concerns that the earlier closure would hurt their business. They argued that Yellowstone’s trails were a major attraction for Expo visitors. In fact, attendance at the Expo has increased each year since the early closure of the Park. Closing the Park early had no apparent impact on the number of Expo visitors or on local businesses that sell goods and services to Expo participants.

Activities other than riding through the Parks draw visitors to the Expo. Major attractions include SnoCross races, snow-drag racing, a snowmobile airshow, where racers compete for the highest jump, a manufacturers showcase of next season’s new snowmobiles and sales and exhibits of snowmobile related goods and services. None of these attractions depend on accessing the Parks by snowmobiles. In fact, poor snow conditions during the 2001 Expo had no apparent impact on visitors to the Expo. “Hotel reservations around town are ‘like a revolving door,’” said Evon Dukes, guest service manager for West Yellowstone’s Conference Hotel. Rooms are available only when a cancellation is made<sup>9</sup>.” Snow conditions were so bad for the 2001 Expo that snow had to be hauled in for the race events. According to those associated with the Expo, poor snow conditions didn’t affect visitor interest in attending the Expo. “People don’t come to the Expo for the snow,” said Alan Doman, manager of the West Yellowstone Conference Hotel. They come for the snowmobile races and to check out the latest gear and newest machines, he said<sup>10</sup>.”

**The 1995-96 Shutdown of the Federal Government.** A report by Neher et al. describes the impacts on West Yellowstone’s economy of two shutdowns of the National Park

<sup>8</sup> Final EIS, page 406

<sup>9</sup> Gura, Bob. 2001 EXPO officials anticipate 10,000. *West Yellowstone News*. March 15

<sup>10</sup> *The Associated Press State and Local Wire*. 2001. Snowmobile Exposition Expects Up To 12,000 people This Weekend. March 18.

system during November 1995 – January 1996, which lasted 27 days total or approximately one-quarter of the winter season<sup>11</sup>. The study reports the economic impacts of the shutdowns on six National Parks or Historic Sites, including Yellowstone. According to the report, the shutdowns had virtually no impact on West Yellowstone’s economy. Rather than avoiding West Yellowstone because of the shutdown, snowmobilers used trails outside of the Parks. The report states that even though the Parks had zero winter visitors for approximately one-quarter of the 1995-96 winter season, earnings in West Yellowstone’s economy declined by just 0.2 percent relative to baseline conditions.

**Poor Trail Conditions in 2001.** At the end of the 2000-01 winter season trails were in such poor condition they were unpassable for snowmobiles. Park managers closed the area to snowmobiles and implemented scheduled snowcoach service to access the Park. Park managers reported that demand for snowcoach seats exceeded the supply and if the more snowcoaches had been available they could have sold even more tickets. Visitors who planned on seeing the Park by snowmobile filled snowcoaches when this public transit system was the only option for viewing the Park. Rather than abandon visiting the park, visitors overwhelmed the available snowcoach service.

The poor snow conditions that resulted in an early closure of the Parks to snowmobiles also had no apparent impact on visitor spending in West Yellowstone. In fact, just the opposite happened. Visitor spending in West Yellowstone during March 2001 increased 63% over spending in March of 2000, based on resort-tax payments and adjusted for 2001 dollars<sup>12</sup>.

**Wild Fires of 1988.** Many predicted disastrous economic consequences for gateway communities from the wildfires that burned a large portion of Yellowstone during 1988. Some local businesses were concerned that tourists wouldn’t visit a burned-over park. At the time, many blamed Park managers for not controlling the fires.

*Park managers were denounced in the press, in local coffee shops and on the floor of the Congress. Wyoming Senator Alan Simpson declared that, “the incineration of Yellowstone is a startling, devastating and dramatic disaster. Let me tell you colleagues, the ground is sterilized. It is blackened to the very depths of any root system within it... Though scientists were nearly universal in their support of this “let it burn” policy, regional residents believed that the fires had destroyed their multimillion dollar tourism industry”<sup>13</sup>...*

Some predicted a long recovery period that further heightened the anxiety of local business.

<sup>11</sup> Neher, Chris, Hank Robinson and John Duffield. 1997. The Economic Impacts of the 1995-96 Shutdown of the National Park System Micro Study. For Montana State University and Yellowstone National Park. May 15.

<sup>12</sup> City of West Yellowstone, resort tax collections.

<sup>13</sup> Glick et al, page 189.

*As critics argue about whom to blame for allowing the fire to get out of hand and debate the government's fire-fighting principals, the flames continue to do more damage—destruction, forestry experts say, will take nature anywhere from 100 to 300 years to repair.<sup>14</sup>*

The record of visitor numbers and expenditures indicates that the concerns of a significant and long-term economic crisis were grossly overstated. In 1988, the year of the fire, the number of visitors declined approximately 15 percent from the 2.6 million visitors in 1987, down to 2.2 million. Visitor expenditures, as reflected in payments of resort taxes, declined 1.7 percent between 1987 and 1989, a much smaller decline than the 15 percent of visitors. By 1989, 2.7 million visitors toured the Park and by 1990, a record 2.8 million visitors traveled through the Park and spend money in gateway communities<sup>15</sup>. Expenditures in 1989 increased 6.3 percent and expenditures in 1990 increased 12.1 percent over previous years<sup>16</sup>. In 1990, a local paper describing the 1990 visitor year reported,

*Wyoming tourism boosters are counting their profits after a banner season...*

*Nearly all agree...that the summer of 1990 was about the busiest ever for Wyoming's tourism industry. In all corners of the state, but especially in the northwest (Yellowstone and Grand Teton National Parks) numbers were way up for almost every segment of the tourism sector.*

*"It was definitely a banner year", said Sheridan County Chamber of Commerce Director Carol Perkins. "It was truly wonderful!"<sup>17</sup>*

Those who predicted doom and gloom economic conditions after the fire ignored the local and regional economy's ability to react to the fire and the resulting economic impacts of this reaction. For example, Backcountry Bicycle Tours in Bozeman, Montana organized six-day bicycle tours of the Park, focusing on the recovery of Yellowstone after the fire. In addition, Park managers, concessionaires and tourism boards from Wyoming and Montana promoted the fire and Yellowstone's resulting rebirth in an ambitious advertising campaign.

**Removal of Fishing Bridge Campground.** A 1972 master plan for Yellowstone called for removing a campground at Fishing Bridge because of its close proximity to feeding areas used by grizzly bears. Business interests in Cody, Wyoming were concerned by this proposal because they thought that if the campground closed, fewer visitors would travel through town on their way to the campground<sup>18</sup>. These fears proved unfounded when, in the late 1980s Park managers closed the campground with no apparent resulting impact

<sup>14</sup> Hackett, George and Michael Lerner. 1988. Fighting for Yellowstone. Newsweek. September 19, page 18.

<sup>15</sup> The Seattle Times Company. 1991. Too many Yellowstone visitors? . The Seattle Times, January 29, page J11.

<sup>16</sup> City of West Yellowstone, resort tax payments.

<sup>17</sup> Milstein, Michael. 1990. Wyoming draws 'em in. The Billings Gazette. October 21, page B4.

<sup>18</sup> Gluck et al. page 188.

on Cody businesses. Closing the campground had no impact on the number of visitors or visitor spending. Visitors pass through Cody because they choose a park entrance based not on where they are going in the Park, but on the direction they are traveling from. Visitors approaching the Park from the east use the east entrance; visitors approaching from the west use the west entrance, etc.

**Predictions of doom and gloom never materialized.** In each case described above some members of the local business community expressed concerns that the incidents would have significant negative impacts on local economies. The aftermath of the wildfires in 1988 represents the most dramatic example of predictions of widespread and significant economic ruin not materializing. In fact, the impacts were minimal, with record numbers of visitors within two years.

The local and regional economies have already demonstrated they are adaptable to change and are able to take advantage of the opportunities that change brings. Based on these three examples, there is every reason to anticipate that these economies have the ability to limit any negative impacts associated with the change in public access and take advantage of the change's positive aspects.

**Economies respond to change.** Economies are not rigid or stagnant systems as depicted in most economic models. They respond to change by seeking out new opportunities. Examples from the incidents described above include concessionaires working with the Parks and state tourism boards to successfully promote Yellowstone after the fires and visitors to the Snowmobile Expo using trails in national forests when the Parks trails were closed. The challenge for decision makers when faced with policies such as the change in public access is maximizing the economic benefits of new opportunities created by change and minimizing the costs of the transition some businesses will face because of the change.

At a time when much of the west was still undeveloped, the majestic beauty and awesome power of the area struck the first white visitors to what later became Yellowstone and Grand Teton National Parks. Established by an Act of Congress on March 1, 1872, Yellowstone is the first and oldest national park in the world. Speaking on the attraction of Yellowstone and natural areas in general, President Richard Nixon noted, "Today, just as in 1872, Yellowstone's capacity to wet man's sense of wonder and refresh his spirit remains ageless and undiminished. . . Parklands and wilderness become more precious to us with each passing year and the forces that militate against them intensify<sup>19</sup>."

Nixon's comment 27 years ago is even more relevant today. In March of 2000, the then Mayor and co-owner of a business that rents snowmobiles, Jerry Johnson, commented that the attraction of the Parks is so strong that changing access in winter will not affect the demand by visitors to see the Parks. "In fact, the park is such a powerful attraction that Johnson thinks even if snowmobiles are banned, there'll just be a bigger demand for

<sup>19</sup> Jaines, Aubrey L. 1974. Yellowstone National Park: Its Exploration and Establishment. Washington, D.C.: US Department of Interior, National Park Service.

seats on snow coaches instead. 'Most people, given a choice, would rather have the freedom, rather ride their own sled.', he says. 'But if they can't, they'll still want to see the park and they'll go in by coach. The town is not going to die<sup>20</sup>.'

Those who predicted people would not visit the Parks because of changes in available transportation or the aftermath of the wildfires underestimated the powerful draw of the Yellowstone and Grand Teton National Park.

#### Positive Impacts of the Change in Public Access

The change in access will have positive impacts on the local economy and on the value of natural resource assets in the Parks. In this section we describe some of those impacts.

*Strengthening Important Economic Forces.* The change in access and the resulting protection of the Parks will strengthen the economic forces responsible for the recent growth and development of local and regional economies. In 1969 approximately one-third of jobs in the Greater Yellowstone Area were in logging, mining, ranching, and farming. By 1997, only 17 percent of jobs were in these traditional extractive industries. Since the mid-1970s, approximately 80 percent of jobs in the GYA have come from the rapidly growing service sector that includes doctors, lawyers, business owners, teachers, etc. The growth in service sector jobs is driven by people and businesses attracted to the region by the high quality of the area's natural environment.

*Over the last two decades, the economy of the Greater Yellowstone region in Idaho, Montana and Wyoming has shifted from extractive industries to services and government. What's happening in Yellowstone is occurring all over the country: rural communities are relying increasingly on the natural lands surrounding them for the amenities they offer to residents rather than the raw materials they provide to commodity industries<sup>21</sup>.*

The quality of the area's amenities is a powerful economic force.

*The economic trends now shaping the communities in the greater Yellowstone region mirror those facing many other scenic areas of the United States. The region's amenities—it's scenery, outdoor opportunities and high quality of life—are promoting a new wave of economic and population growth. In fact, if the 20 counties within the Yellowstone region were considered as a separate state, they would be one of the nation's fastest growing<sup>22</sup>.*

One important implication of the new economic drivers is that efforts to protect the quality of the natural environment will support or re-enforce these important and

powerful new forces of economic growth. The reverse is also true: actions that degrade the quality of the natural environment also threaten the forces driving the area's economic growth and development.

*Diversifying the Local and Regional Economies.* Some visitors may avoid the Parks because of the change, but the cleaner, quieter atmosphere of the Parks in winter will likely attract new visitors. Many potential winter visitors to the Parks are deterred by the presence of snowmobiles, which are noisy, polluting and drive away wildlife. Currently, businesses in gateway communities cater almost exclusively to snowmobilers during the winter season. The new visitors attracted to the Parks because of the change in access represent an opportunities for local business to expand their customer base.

Approximately 96% of the visitors that travel through the Parks during the summer season and represent a huge potential new market for winter visitors. The state travel offices and the Parks successfully coordinated their marketing efforts after the 1988 fires and heavily advertised the Parks. A similar effort, targeting senior citizens, families and other not interested in snowmobiling, or those unable to operate or ride a snowmobile, could emphasize the tranquil atmosphere in the winter. Some visitors no doubt will be more attracted to the relatively warm, friendly atmosphere of snowcoaches instead of the cold, noisy, foul smelling and jarring ride of snowmobiles.

The tourism-based economies of the gateway communities should easily adjust to a more diversified visitor base in winter. Some businesses in West Yellowstone close in the winter in part due to the low numbers of winter visitors and in part because current winter visitors buy a limited range of goods and services. As a result, some businesses that now close in winter may remain open and businesses that remain open will sell to a larger, more diversified customer base.

*Visitors Spend More Time in Gateway Communities.* As described above, seventy-four national parks have implemented successful public-transit systems. Interviews with staff at Denali, Zion and Acadia National parks showed that one impact has been that some visitors spend more time shopping and dining in gateway communities that they did in the past as they wait for scheduled bus service into the parks. It is reasonable to anticipate a similar response to an expanded snowcoach system in the Parks. As more visitors use snowcoaches to access the Parks they will linger longer and spend more money in gateway communities.

*More Comfortable Snowcoach Rides.* The potential future demand for snowcoach rides with the change in access can't be judged based on the experience of current snowmobile rides. That's because almost all snowcoaches share the trails with snowmobiles that degrade the quality of the trail and are loud, pollute the air with their exhaust. Currently, snowmobiles speeding over trails significantly degrades the condition of the trails, that can make riding in a snowcoach uncomfortable. As a result, snowcoach passengers can experience a slow, rough ride and get the full effect of the noise and pollution from snowmobiles that constantly pass the slower snowcoaches. Grooming trails provides limited relieve from the rough and slow ride for snowcoaches because it can take only a

<sup>20</sup> Warner, David. 2000. "Mayor may not like how town is portrayed by media but he's got some ideas of his own" West Yellowstone News. March 30.

<sup>21</sup> How, Jim, Ed McMahon, and Luther Propst. 1997. Balancing Nature and Commerce in Gateway Communities. Island Press. Page 16.

<sup>22</sup> Howe et al., page 16.

few snowmobiles to degrade a groomed trail to the point where snowcoaches must slow down.

Complaints that snowcoaches are too slow or can't access more distant locations in a reasonable amount of time won't be valid with the change in access. According to snowcoach operators, on groomed trails that aren't degraded by snowmobiles, snowcoaches can travel three to four times faster than they currently operate on trails shared with snowmobiles. Not only will the ride be smoother and faster, it will be quieter and noise and fumes from snowmobile exhaust won't bother passengers.

At the end of the 2000-2001 winter season, poor trail conditions forced Park managers to close the Park to snowmobiles, providing public access through a snowcoach system. Not only did the supply exceed the demand but also snowcoach operators reported much greater satisfaction from visitors who were able to experience the Park in its quiet, natural state. It is reasonable to assume that the experience of increased visitor satisfaction and visitors' desire to experience the Park through whatever transportation system is available will result in significant demand for snowcoach access into the Parks.

*Improved Visitor Experiences.* Visitor surveys in the Parks indicated that visitors' experiences often don't meet their expectations.

*{Yellowstone} National Park visitors reported gaps between importance of several characteristics of their visits and the degree of satisfaction with the experience for the characteristic. For example, the importance of "experience the tranquility" was sixth while satisfaction of that characteristic was 18<sup>th</sup>. "Experience peace and quiet" was rated 14<sup>th</sup> in importance and 25<sup>th</sup> in satisfaction. "Get away from crowds" has the largest gap; it was 17<sup>th</sup> in importance and 49<sup>th</sup> in satisfaction. This indicates people feel that the values of tranquility, solitude, peace and quiet are important and anticipated but that they were often dissatisfied with the actual experience ...<sup>23</sup>.*

Based on interviews of staff at national parks that implemented public-transportation systems, the change in public access will likely improve visitor experiences. In general, visitor response was overwhelmingly positive to the new transportation plans. Drivers can now enjoy the view rather than concentrate on driving. With fewer vehicles in the parks visitors are more likely to hear the subtle sounds of the natural environment. Park officials also report increased wildlife sightings near transportation routes after implementing public transit plans. Public transit also promotes increased visitor interactions and provides opportunities to talk with each other and learn about the wildlife, geology, history and landscape that make Yellowstone and Grand Teton National Parks so special.

<sup>23</sup> Final EIS, page 191.

## Conclusions and Recommendations

### The Positive Impacts of the Change in Public Access Will Likely Outweigh Any Negative Impacts

By protecting the quality of the Parks' natural amenities the change in the form of winter access will strengthen important forces driving the growth and development of local and regional economies. Based on the experiences with previous events that affected winter and summer visitation to the Parks, local economies can adjust to the change by seeking out new opportunities. Supporting this transition will be the powerful draw of Yellowstone and Grand Teton National Parks. Any reduction in sales and jobs associated with the change can be offset by increased sales and jobs associated with increased use of snowcoaches in the Park and continued snowmobile access to the lands that surround it.

Any negative impacts will be limited in scope and duration. The natural increase in visitor spending over just one year will roughly match the reduced spending associated with the change.

For these reasons it is reasonable to expect that the positive impacts of the change will outweigh any negative impact, especially over the long term.

### Maximize the Economic Opportunities Offered by the Change in Access

Decision-makers, stakeholders and other interested parties can take steps that will maximize the positive economic impacts of the change and minimize any negative impacts.

- **Develop a coordinated advertising effort that includes the Parks, concessionaires, tourism boards and local businesses.** Using the coordinated effort developed in the wake of the wildfires of 1988 as a guide, Park managers, concessionaires, tourism boards and local businesses could organize and implement an advertising campaign promoting the tranquil experience of the Parks in winter. The campaign could coordinate existing or proposed advertising spending without raising additional funds or increasing planned expenditures. Pooling and targeting resources would increase the effectiveness of the campaign and reach a larger market than would individual efforts by local business, states or agencies. The approximately 96 percent of Park visitors that don't visit during the winter represent a huge, largely untapped potential new market for winter visitors. Senior citizens, families and others not attracted by snowmobiling and those unable to operate or ride a snowmobile also represent a large and growing sectors of the population likely interested in visiting the Parks in winter.
- **Develop a transportation plan in coordination with local governments.** The most important factor in the success of public transit plans in other National Parks is involving the gateway communities in developing the transportation plan. Business owners, residents and local officials had important insights into appropriate routes,

pick up and drop off locations and schedules. Gateway communities should be involved in this in order to maximize the positive impacts of the plan and minimize any negative impacts.

- **Apply for transportation funds to develop and implement the snowcoach system.** According to the National Park Service, there are five public transit demonstration projects that receive support from 20 different funding sources. Possible funding sources for transportation plans associated with a National Park include:

- Congressional construction funds
- National Park transportation funds
- "T-21" funds from the Transportation Equity Act for the 21<sup>st</sup> Century typically distributed through state programs.
- Funds for planning transportation systems are available through the Federal Highway Administration and the Federal Transit System
- Individual parks can solicit "Alternative Transportation Funds" directly from the Park Service<sup>24</sup>.

Additional federal funds may also be available. Recently a group of Senators proposed the "Transit in Parks Act," which would provide a federally funded grant program to support public transit and alternative transportation services for national parks and other federal lands.

Additional funding sources for the snowcoach system can be found in Karen Steer and Nina Chambers' compilation of federal programs targeting economic development in gateway communities<sup>25</sup>.

- **Make the best use of the transition period.** Stakeholders and other interested parties should make good use of the time prior to the full implementation of a snowcoach system by organizing and implementing advertising campaigns, transportation plans and other efforts. Doing nothing or squandering the transition time will maximize the negative impacts of the change and minimize the positive impacts, especially in the short term.

There are signs that some members of the local business community recognize the importance of making the best use of the transition period. Recent efforts include:

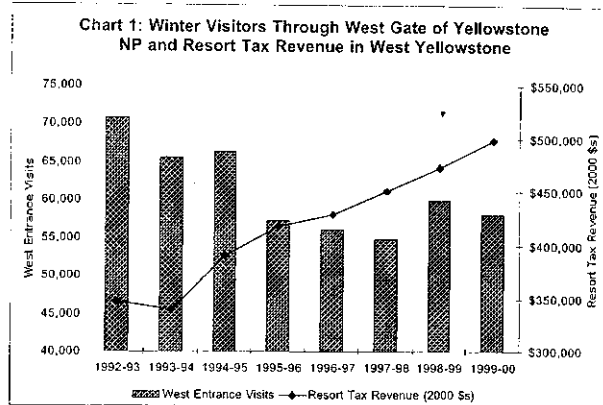
- Snowcoach and snowmobile operators met with representatives of Bombardier, Inc., a recreational-product company that manufactures snowcoaches to brainstorm technological and design improvements for new snowcoaches.

<sup>24</sup> Shea, 2001

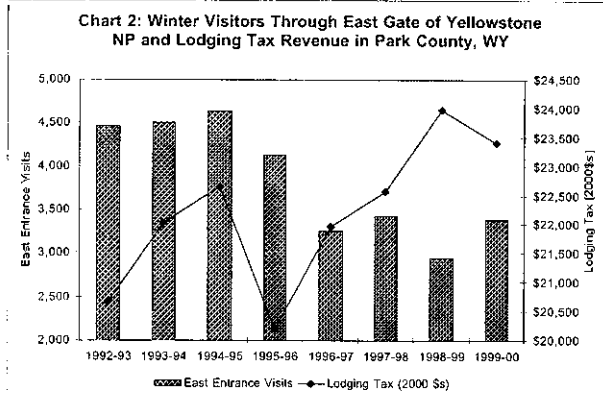
<sup>25</sup> Steer, Karen and Nina Chambers. 2001. Appendix II A Guide to Federal Programs for Rural Community Conservation and Economic Development Projects. In Machlis, Gary E. and Donald R. Field (eds). National Parks and Rural Development. Island Press: Washington, D.C.

- A working group made up of business owners, park concessionaires, representatives from the Park Service and environmental groups formed to lobby for funds to promote and market the Parks, acquire snowcoaches and general economic development efforts to ensure that the transition period proceeds as smoothly as possible<sup>26</sup>.

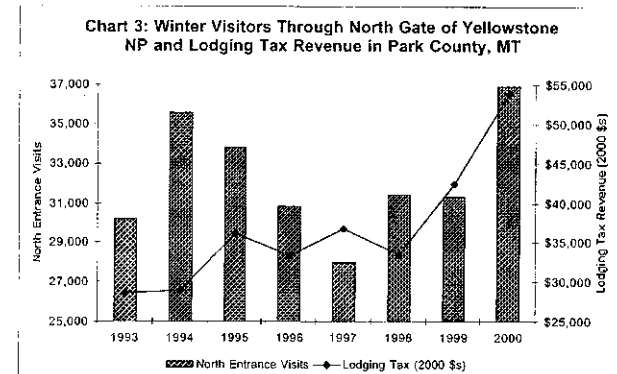
<sup>26</sup> Douglas Edgerton, Councilman, Town of West Yellowstone. 2001. Letter to Montana Governor Judy Martz and Members of the State Legislature. March 21.



Source: National Parks Service, Office of Public Use Statistics; City of West Yellowstone



Source: National Parks Service, Office of Public Use Statistics; Wyoming Department of Revenue.



Source: National Parks Service, Office of Public Use Statistics; State of Montana, State Tourism Agency



"Jacob Smith"  
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 Please respond to  
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To: <gpte.winter.use.seis@nps.gov>  
 cc: "Tom Platt" <tplat@wildrockies.org>, "Bethane Walder"  
 <wildlandsCPR@wildrockies.org>, "Jacob Smith"  
 <prebles@indra.com>  
 Subject: Comments on Yellowstone/Grand Teton Winter Use SEIS

May 29, 2002

VIA EMAIL

Winter Use Draft SEIS Comments  
 Grand Teton and Yellowstone National Parks  
 PO Box 352  
 Moose, Wyoming 83002

Re: Comments on Winter Use SEIS for Yellowstone and Grand Teton National  
 Parks

To Whom It May Concern:

On behalf of Wildlands Center for Preventing Roads (WCPR), our members, and myself as a concerned member of the public with a long-running interest in the management of winter recreation in Yellowstone National Park (YNP) and Grand Teton National Park (GTNP), please fully consider these comments on the National Park Service's (NPS) Winter Use SEIS for Yellowstone and Grand Teton National Parks.

We appreciate the NPS' efforts to reign in the overwhelming onslaught of snowmobiles in YNP and GTNP. As we and others have argued for years, your efforts to eliminate recreational snowmobile use in these Parks is not only legitimate given the agency's legal mandates, but required as well. Given the high protective standards for National Parks, and these Parks in particular, articulated in federal law and regulation and in NPS policy and guidance, and given the magnitude and severity of the environmental impacts and user conflicts caused by snowmobiles, eliminating the recreational use of snowmobiles is the only legal policy option.

In addition to supporting the NPS' general direction on this issue, and strongly encouraging the agency to hold the course with its plan to phase out recreational snowmobile use, we also want to express two major concerns with the plan as well. First, we are concerned about the length of the phase out period. The NPS is well aware that recreation snowmobile use does not belong in the Park; it has conceded as much in this long-running planning process. Yet the NPS is moving toward the necessary elimination of snowmobiles as slowly as possible. While we appreciate the logistical concerns of this management change, the environmental and human health impacts of recreational snowmobiling in the Parks continue, and the transition should be expedited to ensure maximum compliance with the NPS' governing legal duties to protect Park resources. The benefits of such a course of action to the Park resources and natural values themselves are obvious as well.

Second, while the management direction outlined in the FEIS is clearly an improvement over current management, it is still inadequate to meet the agency's legal obligations. The NPS has no legal obligation to provide motorized access to the Park during the winter months. Despite the absence of such a legal mandate, Wildlands CPR does not oppose all motorized recreational access to the Park; a minimal level, consistent with protecting the serenity and quiet, the species, which inhabit the Park, and other environmental values, may be acceptable.

Jacob Smith  
 Wildlands Ctr for Preventing Roads  
 2260 Baseline Rd. Ste 205  
 Boulder, CO 80302

However, the proposed plan allows snowcoach activity on virtually every single route on which snowmobiles now traverse. The presumed reduction in number of vehicles traveling through the Parks in winter is probably an improvement, but snowcoaches will continue to travel on packed snow corridors throughout most of the Parks. The presence of packed routes crisscrossing the Parks, and substantial motorized traffic on these routes, means that many of the major impacts of current winter motorized use in the Parks will continue unabated. The Parks' wildlife and ecosystems will continue to suffer from impacts to movement patterns, migration, food availability and accessibility, disturbance, and other adverse impacts. Impacts of packed snow corridors to bison, and consequently to grizzly bear, also remain unaddressed. We also remain concerned about inadequacies in the Biological Assessment and other documents related to Endangered Species Act compliance. In short, the use of snowcoaches, and the related grooming or packing of routes through the Parks, has significant adverse effects on the Parks' ecosystems and wildlife. This is not permitted under the legal framework guiding NPS management of the Parks. Thus replacing snowmobile traffic with snowcoach traffic is simply not permitted.

These impacts are fully articulated and cited in numerous documents, including the rulemaking petition submitted to the U.S. Forest Service in December 1999 by Wildlands Center for Preventing Roads et al.; the 1999 report prepared by the Montana Wildlife Society (Jochin and Youmans, coordinators) entitled "Effects of Recreation on Rocky Mountain Wildlife," the document entitled "Report and Formal Comments on the Current and Potential Adverse Impacts of Winter Recreational Use in Yellowstone National Park and the Winter Visitor Use Management Planning Process by the U.S. Park Service," prepared by the Biodiversity Legal Foundation and submitted to the National Park Service in May 1996, and the comment letter submitted by D.J. Schubert on October 31, 2000 on behalf of the Fund for Animals regarding the Final Environmental Impact Statement. We incorporate the contents of these documents, and all of the documents they cite, into this comment letter; please review and consider them accordingly. We are happy to provide copies of any of these documents upon request.

With the exception of the two concerns expressed above, we also support and incorporate by reference the comment letter on the SEIS submitted by the Southern Rockies Forest Network.

YNP and GTNP are a crown jewel of our National Park System, and while some visitors have grown accustomed to motorized winter travel in the Parks, the majority of the public stands firmly behind taking the necessary steps to protect and conserve these treasures.

Thank you for your consideration of these comments.

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 Wildlands Center for Preventing Roads  
 2260 Baseline Road, Suite 205  
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May 23, 2002

Winter Use SEIS  
Planning Office  
Grand Teton National Park  
P.O. Box 352  
Moose, WY 83012

To Whom It May Concern:

We wish to submit facts pertinent to the Winter Use Supplemental Environmental Impact Statement for Yellowstone and Grand Teton National Parks. Our organization is a non-profit wildlife research and education organization based in Bozeman, Montana. As the two principals, we have between us 12 years of experience conducting wildlife research in Yellowstone National Park, and a total of 28 years experience conducting wildlife research in the Northern Rocky Mountains, Alaska and Oregon.

During the winter of 2001 - 2002 we conducted a film project to document human-wildlife interactions in Yellowstone National Park (YNP), from December 21, 2001 through March 5, 2002. Two observers were in the field (along the road corridor in YNP) for a total of 59 days monitoring and filming wildlife and human activity along the road system in the southwestern portion of YNP. During 104 observation sessions that occurred during 46 of those days, they spent 83 hours and 52 minutes observing animals that were on or near the road.

Bison spent more time on or near the road than any other wildlife species, and were involved in the majority of wildlife-human interactions. Monitoring of bison occurred during 88% of the observation sessions, monitoring of elk 9%, and monitoring coyotes accounted for 3% of the observation sessions.

A total of 88 negative interactions occurred during these observations. A negative interaction was defined as one where human activities caused significant disruption of animal's behavior. Negative interactions included animals running away, animals jumping over the snow berm on the side of the road or otherwise moving off the road into deep snow, animals that stopped feeding, and animals becoming agitated or alarmed. Of the 88 negative interactions, 63 of these involved snowmobiles, 27 involved snowcoaches, and 2 involved people on foot who climbed off of their snowmobiles. There was overlap in several situations where both snowmobiles and snowcoaches were present. Of the negative interactions, 70% were a result of snowmobile activity, 29.98% were a result of snowcoach activity and .02% were a result of humans on foot.

Negative interactions occurred at a rate of one for every 61 minutes of observation. Extrapolating that statistic to the total time of human activity in Yellowstone (9 am to 5 pm from December 20 through March 9, or a total of 79 days), produces an minimum estimate of 622 negative interactions between humans and wildlife over the course of the winter use season. This is a minimum because observers were only at one place at a time, and interactions were undoubtedly occurring at other places.

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email: wtun@mcn.net



Human behaviors that were observed during negative interactions included: making inappropriate passes of animals resulting in spooking of animals, chasing or herding animals, stopping less than 25 meters from animals, throwing snowballs at animals, and bison movement halted due to blocked road. One snowmobiler was observed trying to pet a bison as she passed the animal.

This data should be considered as the National Park Service makes its decision regarding future winter access into Yellowstone and Grand Teton National Parks, and should be submitted as part of the permanent record. Thank you.

Sincerely,

Betsy Robinson  
Executive Director

Steve Gehman  
Program Director



**WOMEN'S VOICES FOR THE EARTH**

114 W. PINE STREET, MISSOULA, MONTANA 59802 TEL: 406-543-3747 FAX 406-542-5632

May 29<sup>th</sup>, 2002

Winter Use Draft SEIS Comments  
 Grand Teton and Yellowstone National Parks  
 P.O. Box 352  
 Moose, WY 83012

Dear Park Service,

These comments are submitted on behalf of Women's Voices for the Earth. Women's Voices for the Earth, based in Missoula, MT, is a women-centered environmental justice organization. Our mission is to empower women to create an ecologically sustainable and socially just society.

We believe Yellowstone National Park should be a beautiful and healthy place both to work in and to visit. Many of our members, who live predominately in Montana, are regular recreationists in Yellowstone and have great interest in promoting its healthy future. We are concerned about the health impacts of several of the alternatives discussed in this EIS. We are especially dismayed by the lack of detailed discussion and analysis of human health effects from both criteria and hazardous air pollutants. **Given the lack of detail we can only support Alternative 1a, which shows a clear improvement over the currently dismal health effects seen in the Park.**

1.) We are concerned that several of the alternatives will result in noncompliance with National and State Ambient Air Quality Standards.

Carbon Monoxide

According to tables 44 and 45, carbon monoxide levels will exceed standards for alternative 1b, 2 and 3 in the first year. CO levels are likely to continue to exceed standards in the second year in both alternative 1b and 2. Carbon monoxide is a poisonous gas that is both colorless and odorless (which means exposure is difficult for a person to recognize and avoid). Symptoms caused by low-level exposures are: headaches, fatigue, visual impairment and other perception problems. These are all problems which have been reported by both workers and visitors to the Park. Carbon monoxide exposures can also lead to respiratory failure and death. In a healthy person, high level exposure would be required to cause death, but in a person with compromised health (especially cardiovascular or pulmonary disease) much lower levels could be fatal. This SEIS should aim to fix the pollution problem, not merely maintain negative health effects at a lower level. **Given the uncertainties of modeling, the Park Service must develop alternatives with lower CO emissions which reflect a wider margin of error.**

Particulate Matter

PM-10 emissions are also of great concern. While none of the alternatives propose emissions which exceed current PM-10 standards, it is well-known that negative health impacts can and do occur at levels lower than these standards. In addition, there is no discussion in the SEIS of estimated PM-2.5 levels from the various alternatives. The SEIS incorporates the public health impacts section of the FEIS by reference. However, at the time the FEIS was written the PM 2.5 rules were being litigated. Since then, they have been upheld by the Supreme Court and will be promulgated. There seems to be little data on PM 2.5 in the park, but the data from (Kado, 1999) suggest that PM-2.5 emissions are comparable if not identical to PM-10 emissions. **Given this frame of reference, it is highly likely that PM-2.5 emissions will exceed standards in the first year of implementation for Alternatives 1b, 2 and 3. PM-2.5 emissions must be discussed in detail in the final SEIS.**

2) Particulate emissions cause greater health impacts than those reported in this SEIS, such as (and most importantly) increased mortality.

We were surprised to see the lack of detail in the discussion of potential health impacts, especially in light of the overwhelming body of scientific literature on the subject. The SEIS merely states that:

*Health effects from PM emissions include reduced lung function, aggravation of respiratory ailments, long-term risk of increased cancer rates, and development of respiratory problems. (P.100)*

This is quite an understatement. We have attached a document from the American Lung Association entitled "Selected Key Studies on Particulate Matter and Health: 1997-2001" which indicates that more than 800 new scientific studies on particulates and health have been published since 1996. Not one of these studies is mentioned by name in the SEIS. The American Lung Association's reports that beyond aggravation of respiratory problems, particulate matter pollution has been directly linked to increased deaths in study after study. We have also attached one of the most recent studies on this issue, published in the Journal of the American Medical Association in March 2002. This study found that each 10 ug/m3 increase in ambient particulate pollution corresponded to an 4% increase in death from all-causes, a 6% increase in cardiopulmonary death and an 8% increase in lung cancer mortality (Pope, 2002). Other studies have shown that cardiac events are more likely to occur after air pollution episodes. For example, a 1999 study in central Europe showed that men and women had elevated heart rates during an air pollution episode of elevated concentrations of sulfur dioxide, total suspended particulates and carbon monoxide (Peters, 1999). Elevated heart rates are a risk factor for death and fatal heart disease. Another study showed that potentially fatal arrhythmias increased one to two days after exposure to PM-10 and PM 2.5 (Peters, 2000.) **Spending a day in Yellowstone at current air pollution levels could be considered an air pollution episode, and may well have caused cardiac related deaths already, particularly in people with compromised**

health. This SEIS must ensure that these persons can do so without a risk to their life and health simply from breathing the air.

3) The main focus of the air pollution and public health analyses in this SEIS are the criteria pollutants (i.e. those subject to the NAAQS). Discussion and analysis of toxic air pollutants is lacking and must be included in the final SEIS.

The SEIS merely states that VOCs such as benzene and formaldehyde and other hazardous air pollutants such as 1,3-butadiene are generated by snowmobiles. There is no discussion whatsoever of the health impacts of these chemicals.

#### Benzene

According to the ATSDR Public Health Statement on Benzene, (available at: <http://www.atsdr.cdc.gov/toxprofiles/phs3.html>) benzene is a highly toxic chemical that can cause a variety of effects. At very high levels (10,000-20,000 ppm), benzene can cause death, at lower levels (700-3,000ppm) benzene leads to drowsiness, headaches, confusion, rapid heart rate. Again, these are all symptoms which have been reported to the Park Service by visitors and workers. Benzene also causes chronic problems, which may take years to develop. According to the ATSDR.

*People who breathe benzene for long periods may experience harmful effects in the tissues that form blood cells, especially the bone marrow. These effects can disrupt normal blood production and cause a decrease in important blood components. A decrease in red blood cells can lead to anemia...*

*Exposure to benzene may be harmful to the reproductive organs. Some women workers who breathed high levels of benzene for many months had irregular menstrual periods. When examined, these women showed a decrease in the size of their ovaries...*

*Studies with pregnant animals show that breathing benzene has harmful effects on the developing fetus. These effects include low birth weight, delayed bone formation, and bone marrow damage...*

*The Department of Health and Human Services (DHHS) has determined that benzene is a known carcinogen. The International Agency for Cancer Research (IARC) has determined that benzene is carcinogenic to humans, and the EPA has determined that benzene is a human carcinogen. Long-term exposure to relatively high levels of benzene in the air can cause cancer of the blood-forming organs. This condition is called leukemia. Exposure to benzene has been associated with development of a particular type of leukemia called acute myeloid leukemia (AML).*

These are not health effects to be taken lightly, and certainly should not be ignored by the Park Service. We are very concerned about Park employees in particular, who are chronically exposed to benzene. The SEIS also states that certain employees were exposed to levels of

benzene above OSHA standards. This should be a major cause of concern, especially since OSHA standards are notoriously weak at protecting worker health. **The final SEIS must include specific information on the health effects of benzene and an analysis of how the alternatives will affect benzene emissions.**

#### Formaldehyde

Formaldehyde is a highly toxic chemical that can cause a variety of effects at very low levels of exposure. According to the ATSDR Public Health Statement on Formaldehyde, (available at: <http://www.atsdr.cdc.gov/toxprofiles/phs111.html>) exposures to air concentrations as low as 20ppm are immediately dangerous to life and health. At levels of 0.3-4ppm, irritation of the eyes, nose and throat will occur. Once again these are symptoms that have been reported to the Park Service by workers and visitors. ATSDR states:

*Several studies of laboratory rats exposed for life to high amounts of formaldehyde in air found that the rats developed nose cancer. Some studies of humans exposed to lower amounts of formaldehyde in workplace air found more cases of cancer of the nose and throat (nasopharyngeal cancer) than expected, but other studies have not found nasopharyngeal cancer in other groups of workers exposed to formaldehyde in air. The Department of Health and Human Services (DHHS) has determined that formaldehyde may reasonably be anticipated to be a human carcinogen (NTP).*

Cancer is not a health impact to be ignored and must be considered and discussed in the final SEIS. Especially considering that certain employees were exposed to levels of formaldehyde above OSHA standards, **the final SEIS must include specific information on the health effects of formaldehyde and an analysis of how the alternatives will affect formaldehyde emissions.**

#### 1,3 Butadiene

1,3 Butadiene is another highly toxic air pollutant that is briefly mentioned in the SEIS. The ATSDR Public Health Statement on 1, 3 Butadiene (available at: <http://www.atsdr.cdc.gov/toxprofiles/phs28.html>) tells us that even short term exposures to low levels will cause problems such as eye, nose and throat irritation. These are, of course, symptoms that have already been reported to the Park Service by workers and visitors. Short term exposures to very high levels can cause symptoms like drunkenness or loss of consciousness and even death. There is a wealth of chronic illnesses which develop from long-term 1,3 butadiene exposure. According to the ATSDR,

*Studies of rubber industry workers suggested possible harmful effects such as more cases of heart diseases, blood diseases, lung diseases, and even cancer from the long-term exposure to low levels of 1,3-butadiene...*

*Laboratory animals that breathed in high levels of 1,3-butadiene for a short time died. Mice that survived exposure to 1,3-butadiene longer than 14 days had damage in the organs that make blood cells and damage to nose tissues... Pregnant mice that breathed in low amounts of 1,3-butadiene had miscarriages. Birth defects were found in offspring of rats and mice exposed to 1,3-butadiene during pregnancy. Rats that breathed in lower levels of 1,3-butadiene for more than 1 year had kidney disease and damaged lungs; some of them died. Mice that breathed in lower levels of 1,3-butadiene for more than 1 year had harmful effects in their reproductive organs and damaged livers. Rats and mice that breathed in small amounts of 1,3-butadiene for a long time period developed cancer in many organs.*

These long term impacts are troubling and are worthy of discussion and analysis in the SEIS. Especially since there are limited data on humans exposed to 1,3 Butadiene, the Park Service should be especially cautious in determining allowable emissions. The data on rats and mice indicating severe reproductive effects and adverse birth outcomes are of particular concern, especially to any women working at the Park who are or intend to become pregnant. **It is vital that the Park Service include information and analysis on 1,3 Butadiene emissions in the final SEIS.**

#### Toluene

According to the FEIS, of all the air toxics, toluene had the highest concentrations in the Park. The ATSDR Public Health Statement for Toluene (available at: <http://www.atsdr.cdc.gov/toxprofiles/phs56.html>) toluene is a toxic chemical that most seriously affects the brain. Low to moderate daily exposure leads to tiredness, confusion, weakness, nausea and loss of appetite. Once again, these are symptoms we already know workers and visitors are experiencing. Longer term exposure can lead to hearing loss and other possible permanent damage to the brain. Other effects reported by ATSDR include:

*Toluene may change the way your kidneys work, but in most cases, the kidneys will return to normal after exposure stops. If you drink alcohol and are exposed to toluene, the combination can affect your liver more than either compound alone. This phenomenon is called synergism. Combinations of toluene and some common medicines like aspirin and acetaminophen may increase the effects of toluene on your hearing... In animals, the main effect of toluene is on the nervous system. Animals exposed to moderate or high levels of toluene may also show slightly adverse effects in their liver, kidneys, and lungs.*

*Several studies have shown that unborn animals were harmed when high levels of toluene were breathed in by their mothers. When the mothers were fed high levels of toluene, the unborn animals did not show any structural birth defects, although*

*some effects on behavior were noted. We do not know if toluene would harm your unborn child if you drink water or breathe air containing low levels of toluene, because studies in people are not comprehensive enough to measure this effect. However, if you deliberately breathe in large amounts of toluene during your pregnancy, your baby can have neurological problems and retarded growth and development.*

**As with 1,3 Butadiene, impacts to pregnant women and developing fetuses from toluene are worrisome and must be discussed and accounted for in the final SEIS. An analysis of how the alternatives will differ in toluene emissions is crucial.**

4.) There is no discussion of the potential for synergism between the multiple chemicals workers and visitors may be exposed to in the Park.

While data may be limited on synergistic effects, the final SEIS must at least address the issue, that health impacts may vary depending on the combination of different air pollutants a person is exposed to. These effects in fact can be multiplicative. As seen above with toluene, there is some evidence that exposure to toluene is exacerbated by intake of aspirin and acetaminophen. This kind of information is very important in making management decisions based on public health. **We ask that the SEIS acknowledge that synergistic effects may occur and discuss the problems with uncertainty of the data.**

5.) **Given that we do have limited data about the potential long term and chronic impacts of air and their combinations, we ask the Park Service to act with caution as you make your decisions.** Many of the chemicals discussed above have low level acute symptoms which we are already seeing in Park employees and visitors. These are your warning signs for the future. We ask that you heed them with caution, and make decisions that will appropriately avoid more serious health effects in the future.

Thank you for the opportunity to comment on this draft SEIS. We appreciate your consideration of these comments. Please send us a copy of the final SEIS. We would prefer it in digital form if possible, if it is available on a website, a notice of the link will be sufficient.

Sincerely



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Women's Voices for the Earth  
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## References:

Kado, N. et al. 1999. Measurement of Toxic Air Pollutants Emitted from Snowmobiles at Yellowstone National Park. Final Report. Prepared for the Yellowstone Park Foundation, Pew Charitable Trust and National Park Service.

Peters A. et al. 1999. Increases in Heart Rate During an Air Pollution Episode. American Journal of Epidemiology 1999; 150:1094-8.

Peters A. et al. 2000. Air Pollution and Incidence of Cardiac Arrhythmia. Epidemiology 2000 Jan; 11 (1):11-17.

Pope, C et al. 2002. Lung Cancer, Cardiopulmonary Mortality and Long-term Exposure to Fine Particulate Air Pollution. Journal of the American Medical Association, March 6, 2002 - Vol 287, No. 9 pp. 1132-41.

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**When You Can't  
Breathe,  
Nothing Else  
Matters**

For nearly 100 years, the American Lung Association, Lung Association affiliates throughout the United States and the American Thoracic Society have worked together in the fight against lung disease.



Updated March 5, 2001

## SELECTED KEY STUDIES ON PARTICULATE MATTER AND HEALTH: 1997 - 2001

### NEW STUDIES CONFIRM THAT CURRENT LEVELS OF PARTICULATE AIR POLLUTION ARE HARMFUL TO HUMAN HEALTH

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to review and update the National Ambient Air Quality Standards for major air pollutants every five years, in light of the latest scientific evidence.

More than 800 new scientific studies related to the effect of airborne particulates on human health have been published since 1996, when EPA last reviewed the standards for particulate matter. The new studies validate the earlier research and address the most important arguments raised by industry critics. Taken together, the studies confirm the relationship between particulate air pollution, illness, hospitalization, and premature death. The major themes of the new research are that the:

- Major long-term studies have been fully validated.
- New short-term studies from across the U.S. and around the world confirm the mortality effects.
- New analyses show that lives may be shortened by months or years, rather than days.
- Recent studies of laboratory animals and humans have identified cardiac responses to particles, thus elucidating possible biologic mechanisms for mortality.
- New studies demonstrate that infants and children, particularly asthmatic children, are especially sensitive to the effects of fine particle pollution.

In 1997 when EPA announced the establishment of new NAAQS for fine particles, the President directed EPA to complete a review of the standards by July 2002.

The National Academy of Sciences (NAS) has issued several reports recommending research priorities to increase scientific understanding of particle pollution. To address the scientific issues raised by the NAS panel, EPA increased funding for research on particulates to more than \$50 million

per year. As part of this effort, the Health Effects Institute, jointly sponsored by industry and EPA, has committed substantial resources to research on PM.

As a result of this infusion of research funds, hundreds of scientific papers and research reports have been published since EPA last issued its "Air Quality Criteria for Particulate Matter" in 1996.

This annotated bibliography presents the findings of some of the most significant new research studies that advance our understanding of the harmful health effects of particulate air pollution. The peer-reviewed papers cited here represent a small sample of the scientific articles on the health effects of particulate air pollution published since 1996. This bibliography does not attempt to be comprehensive: exclusion does not imply that a study is unimportant; inclusion does not imply endorsement.

#### LONG-TERM STUDIES OF MORTALITY

##### Prospective Cohort Epidemiological Studies Are Validated in Independent Reanalysis

Two landmark prospective cohort studies reported that chronic exposure to particulate pollution increases the risk of premature mortality. In the 1993 Six Cities Study, Harvard University researchers followed the health of more than 8,000 people in six small cities that fell along a gradient of air pollution concentrations for a period of 14 to 16 years. As particle concentrations increased, there was an almost directly proportional increase in the death rate in the residents studied. Residents of the most polluted city in the study, Steubenville, Ohio, had a 26 percent increased risk of premature mortality, compared to the residents of the cleanest city studied, Portage, Wisconsin. The increased risks were associated with a difference in ambient fine particle concentrations of 18.6 micrograms per cubic meter.

The 1995 American Cancer Society study reported an association between fine particle air pollution and premature death by cardio-pulmonary and other causes in a study group of over half a million people in 151 U.S. cities. All cause mortality increased by 17 percent with a 24.5 microgram per cubic meter difference in fine particle pollution between the cleanest and dirtiest city studied.

These original studies used statistical techniques to adjust for age, and to control for the effects of smoking, diet, and occupational exposure.

Health Effects Institute funded researchers, led by Dr. Dan Krewski of the University of Ottawa, undertook a reanalysis of the original studies and a quality audit of the underlying data. Researchers performed an extensive sensitivity analysis using alternative statistical methods, and considering the role of 20 potential confounders such as other pollutants, climate, and socio-economic factors on study results. The sensitivity analysis largely confirmed the original results of the Harvard Six Cities Study and the

American Cancer Society Study. In addition, the sensitivity analysis identified higher educational status as a factor associated with reduced risk to air pollution exposure, and reported an association between sulfur dioxide pollution and mortality.

Krewski, D., Burnett, R.R., Goldberg, M.S., Hoover, K., Siemiatycki, J., Jerrett, M., Abrahamowicz, M., White, W.H., and Others. Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality. Health Effects Institute, July, 2000.

Dockery, D.W., Pope, C.A., Xu, X., Spengler, J.D., Ware, J.H., Fay, M.F., Ferris, B.G., and Speizer, F.E. An Association Between Air Pollution and Mortality in Six U.S. Cities. New England Journal of Medicine, 1993;329:1753-9.

Pope, C.A., Thun, M.J., Namboodiri, M.M., Dockery, D.W., Evans, J.S., Speizer, F.E., and Heath, C.W. Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults. American Journal of Respiratory Critical Care Medicine, 1995;151:669-74.

##### Chronic Exposure to Particulate Pollution Shortens Lives by One to Three Years

There have been two recent attempts to quantify the extent of life shortening predicted by the long-term epidemiological studies. Dutch scientist Dr. Burt Brunekreef made such an estimate in a paper prepared for the World Health Organization's consideration of revisions to the Air Quality Guidelines for Europe. Using risk ratios reported in the Harvard Six Cities Study and the Study of the American Cancer Society cohort, Brunekreef conducted a life table analysis to estimate the effect of particulate air pollution on the survival rate of 25 year-old Dutch men. An extrapolation based on U.S. life tables yields an estimated diminished life expectancy of 1.31 years due to ambient pollution.

Dr. C. Arden Pope III, of Brigham Young University, analyzed reductions in life expectancy in the U.S. population due to chronic exposure to particulate matter. He applied relative risks for premature death derived from the prospective cohort studies, and estimated loss of life expectancy ranging from one to three years, depending upon assumptions about the age at which susceptibility to the effects of air pollution begins.

Brunekreef, Burt. Air Pollution and Life Expectancy: Is There a Relation? Occup Environ Med 1997 Nov; 54(11):781-4.

Pope, C.A. III. Epidemiology of Fine Particulate Air Pollution and Human Health: Biological Mechanisms and Who's at Risk? Environ Health Perspect 108 (suppl 4):713-723 (2000).

#### DAILY MORTALITY STUDIES

##### 90-City National Morbidity, Mortality and Air Pollution Study (NMMAPS) Shows that Contemporary Levels of Air Pollution are Killing People

The Health Effects Institute, which is jointly funded by EPA and industry, commissioned an original nationwide study of the short-term effects of air pollution on human health, known as the National Morbidity, Mortality and Air Pollution Study, or NMMAPS. A team of investigators led by Dr. Jonathan Samet of the Johns Hopkins University School

of Public Health developed and applied a standardized methodology for examining pollution effects across many cities. Investigators from Johns Hopkins University and Harvard University developed and applied state-of-the-art statistical techniques to examine the effects of multiple pollutants, the extent of life-shortening, and the degree of "exposure measurement error" due to reliance on centrally located air quality monitors.

In its study of the 90 largest U.S. cities, NMMAPS found strong evidence linking daily increases in particulate pollution to increases in death. On average, overall mortality increased by 0.5 percent for every 10 microgram per cubic meter increase in  $PM_{10}$  measured the day before death. The effect was slightly greater for deaths due to heart and lung disease than for total deaths. This risk ratio is somewhat lower than reported by earlier meta-analyses, perhaps due to certain methodological assumptions such as a one-day lag.

Samet et al. report that the relative increases in daily mortality partly reflect life shortening on the order of months. The association between particulate matter and mortality persists even when other pollutants are included in the statistical model. Their analyses also provide evidence against arguments that exposure measurement error could explain the associations between particulate matter and adverse health effects.

In addition, in a study of 14 U.S. cities, NMMAPS found strong and consistent associations between particulate air pollution and hospital admissions among the elderly. Hospital admissions data was obtained from the Medicare program. The cities were selected for study because they had daily  $PM_{10}$  measurements.

For each 10 microgram per cubic meter increase in  $PM_{10}$ , there was approximately a 1 percent increase in hospital admissions for cardiovascular disease, and about a 2 percent increase in admissions for pneumonia and chronic obstructive pulmonary disease. Cities studied were Birmingham, AL, Boulder, CO, Canton, OH, Chicago, IL, Colorado Springs, CO, Detroit, MI, Minneapolis/St. Paul, MN, Nashville, TN, New Haven, CT, Pittsburgh, PA, Provo/Orem, UT, Seattle, WA, Spokane, WA, and Youngstown, OH.

Investigators concluded that the complementary analyses of mortality and morbidity provide "new and strong evidence" linking particulate air pollution at current levels to adverse health effects.

Some of the results from the NMMAPS study were published in an article in the New England Journal of Medicine. Samet, et al. examined the effect of five of the most widespread outdoor air pollutants -- particulate matter, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide in 20 of the largest cities in the United States. The study was specifically designed to address many of the criticisms of earlier single-city studies. The study found consistent evidence that relatively small daily increases in particulate pollution were followed by daily increases in death rates, particularly from heart- and lung-related causes. Study authors noted that other analyses have demonstrated that the amount of life lost due to particulate pollution goes beyond just a few days. The study

investigators also reported an association between summertime ozone levels and mortality.

The New England Journal of Medicine article concludes, "there is consistent evidence that the levels of fine particulate matter in the air are associated with the risk of death from all causes and from cardiovascular and respiratory illness. These findings strengthen the rationale for controlling the levels of respirable particles in outdoor air."

Samet, J.M., Dominici, F., Zeger, S.L., Schwartz, J., and Dockery, D.W. The National Morbidity, Mortality, and Air Pollution Study. Part I: Methods and Methodologic Issues. Health Effects Institute Research Report 94, Part I, May 2000.

Samet, J.M., Zeger, S.L., Dominici, F., Currier, F., Coursac, I., Dockery, D.W., Schwartz, J., and Zanobetti, A. The National Morbidity, Mortality, and Air Pollution Study. Part II: Morbidity, Mortality and Air Pollution in the United States. Health Effects Institute Research Report 94, Part II, June 2000.

Samet, J.M., Dominici, F., Currier, F.C., Coursac, I., and Zeger, S.L. Fine Particulate Air Pollution and Mortality in 20 U.S. Cities, 1987-1994. New England Journal of Medicine, Vol. 343, No. 24, pp. 1742-1749, December 14, 2000.

#### Air Pollution Effects Persist for Several Days, Increasing the Overall Risk of Exposure

Epidemiological studies have used different assumptions about the number of days following exposure to air pollution that effects will occur. Some studies have assumed that effects occur the day after exposures. However, toxicological evidence suggests that effects of exposure may be observed over several subsequent days. In an analysis using data from New Haven, Birmingham, Pittsburgh, Canton, Detroit, Chicago, Minneapolis, Colorado Springs, Spokane, and Seattle, Dr. Joel Schwartz, of the Harvard School of Public Health, has shown that statistical models that assume a one day lag, such as NMMAPS, grossly underestimate the effect of  $PM_{10}$  on mortality. Assuming that effects continue over several days, as demonstrated by this analysis, roughly doubles the relative risk of premature mortality.

Schwartz, Joel. The Distributed Lag Between Air Pollution and Daily Deaths. Epidemiology 2000;11:320-326).

#### $PM_{2.5}$ from Motor Vehicles and Coal Combustion is Linked to Increased Mortality

Investigators from Harvard Medical School used data on the elemental composition of size-fractionated particles to identify the sources of fine particles in six eastern U.S. cities that have been the subject of a long-term air pollution study: Watertown, MA, Kingston-Harriman, TN, St. Louis, MO, Steubenville, OH, Portage, WI, and Topeka, KS. For example, lead was used as a tracer for motor vehicle exhaust, selenium for coal combustion, and silicon for soil and crustal matter. Each of these fractions was examined in association with daily mortality rates in each city. The study reported that a  $10 \mu\text{g}/\text{m}^3$  increase in  $PM_{2.5}$  from mobile sources accounted for a 3.4% increase in daily mortality, while the equivalent increase in fine particles from coal combustion sources

accounted for a 1.1% increase. Fine particles from crustal sources were not associated with mortality. The study concludes that *"the results indicate that combustion particles in the fine fraction from mobile and coal combustion sources, but not fine crustal particles, are associated with increased mortality."*

Laden, F. Neus, L.M., Dockery, D.W., and Schwartz, J. Association of Fine Particulate Matter from Different Sources with Daily Mortality in Six U.S. Cities. *Environmental Health Perspectives* 108:941-947, October 2000.

#### Daily Mortality Studies Pour In From Cities Around the World

Studies in new locations and by additional investigators with consistent results help strengthen the case for a causal relationship.

EPA's 1996 review of the PM standards cited over two dozen short-term epidemiological studies. Since then, time series studies reporting an association between short-term exposure to particulate matter and early mortality have been published for these U.S. cities: **Philadelphia; Ogden, Salt Lake City, and Provo/Orem, Utah; Seattle; Santa Clara County, California; and Buffalo.** Additional studies have been published for these major cities all over the world: **Toronto; Mexico City; London; Edinburgh; Birmingham, UK; Rotterdam; Helsinki; Madrid; Rome; Milan; Brisbane; Sydney; Delhi; Bangkok; and Seoul and Ulsan, Korea.** Many of the new studies have evaluated the sensitivity of the estimated PM effects to the inclusion of other pollutants in the statistical model. Overall, the associations of PM with adverse effects continue to be consistently observed, and sometimes, effects of other air pollutants such as ozone, sulfur dioxide, nitrogen dioxide, and carbon monoxide are also reported.

A multi-city study of the short-term health effects of air pollution on mortality and hospital emergency admissions was initiated by the European Union Environment Programme. The study, known as Air Pollution and Health: A European Approach or APHEA, investigated the effects of several pollutants on mortality in 12 European cities. The study reported positive associations with sulfur dioxide and PM<sub>10</sub>, and daily increases in mortality, with stronger and more consistent associations observed in western European cities.

A quantitative meta-analysis by Jonathan Levy et al. of the Harvard School of Public Health set out to compare mortality estimates from over twenty daily time series studies. Their analysis estimated that mortality rates increased by approximately 0.7 percent per 10 microgram per cubic meter increase in PM<sub>10</sub> concentrations. Investigators reported *"our model finds compelling evidence that the PM<sub>10</sub>-mortality relationship is stronger in locations with higher PM<sub>2.5</sub>/PM<sub>10</sub> ratios, supporting the hypothesized role of fine particles."*

U.S. EPA Office of Research and Development. Air Quality Criteria for Particulate Matter. EPA/600/P-99/002b, Oct. 1999, External Review Draft.

Katsouyanni, K., Touloumi, G., Spix, C., Schwartz, J., Balducci, F., Medina, S., Rossi, G., Wojtyniak, B., Sunyer, J., Bacharova, L., Schouten, J.P., Ponka, A., and Anderson, H.R. Short Term Effects of Ambient Sulphur Dioxide and Particulate Matter on Mortality in 12 European Cities: Results From Time Series Data From the APHEA Project. *British Medical Journal* 1997; 314:1658 (7 June).

Levy, J. I., Himmelfarb, J.K., and Spengler, J.D. Estimating the Mortality Impacts of Particulate Matter: What can be Learned from Between-Study Variability? *Environ Health Perspect* 108:109-117(2000).

#### "HARVESTING" THEORY DISPROVEN

##### Mortality Reported in Short Term Community Health Studies is Not Due to "Harvesting"

Numerous short-term epidemiological studies have reported that short-term increases in air pollution are followed by an increased number of deaths. Some have argued that the associations between day to day variations in mortality and air pollution represent a "harvesting" effect, that is, the advancement of death by a few days in people already about to die from other causes. If air pollution advances death of the very frail by only a few days (the "harvesting" hypothesis), then you would expect that an increase in daily deaths would be followed by a decrease in deaths within a few days.

Professors Scott Zeger and Francesca Dominici of the Johns Hopkins School of Public Health developed a statistical technique to examine harvesting using data on total suspended particulate matter (TSP) and total mortality in **Philadelphia**. They found that removing the shortest term fluctuations from their time series increased rather than decreased the estimates of pollution effects. This is the opposite of what would be expected if "harvesting" accounted for all the deaths.

As part of the NMMAPS study, Dr. Joel Schwartz of the Harvard School of Public Health studied this issue using data from **Boston**. He reported that for chronic obstructive pulmonary disease and ischemic heart disease, most of the deaths seem to be advanced by a few months on average. The statistical approach did not allow estimates of life shortening beyond two months. In contrast, for pneumonia, the analysis showed that some deaths are brought forward by a few days, consistent with the harvesting hypothesis. Effect estimates increased when examining longer time periods, suggesting that cumulative exposures are more harmful than daily exposures. Overall, these results suggest that the short-term epidemiological studies underestimate the number of early deaths.

Zeger, S.L., Dominici, F. and Samet, J. Harvesting-Resistant Estimates of Air Pollution Effects on Mortality. *Epidemiology* 1999 Mar.;10(2):171-5.

Schwartz, Joel. Harvesting and Long Term Exposure Effects in the Relation between Air Pollution and Mortality. *Am J Epidemiol* 2000; 151:440-8.

#### Most Air Pollution Related Deaths Are Being Advanced By Months to Years

While the association between particulate air pollution and mortality is generally acknowledged to be causal, critics have claimed that the public health impact is minor, because people are dying just a few days early. This theory is sometimes called "harvesting." This study is based on an examination of daily deaths and hospital admissions in Chicago for the years 1988-1993. If people are dying a few days early, then the death rate should drop a few days after the air pollution event. The analysis shows that this is not the case. The results confirm findings previously reported for Boston and Philadelphia, using a different methodology. The author concludes that the results indicate that air pollution may be increasing the overall number of people at risk of death, and that most of the deaths are being advanced by months to years.

Schwartz, Joel. Is There Harvesting in the Association of Airborne Particles with Daily Deaths and Hospital Admissions. *Epidemiology*, Vol. 12, No. 1, pp 56-61, January 2001.

#### PM-MORTALITY RELATIONSHIP IS LINEAR, WITH NO THRESHOLDS

##### No Threshold is Evident for the Effect of PM<sub>10</sub> on Daily Deaths

In the Schwartz and Zanobetti study, Harvard University researchers applied a statistical method to examine the shape of the dose-response relationship between air pollution and daily deaths in ten U.S. cities. The cities studied were New Haven, Birmingham, AL, Pittsburgh, Detroit, Canton, OH, Chicago, Minneapolis-St. Paul, Colorado Springs, Spokane, and Seattle. Simulation studies demonstrated that the method used can detect threshold and other nonlinear relationships in epidemiologic studies. But when used to analyze the association between PM<sub>10</sub> and mortality, no evidence of a threshold was found, and the associations appeared to be linear down to the lowest levels studied. This is consistent with earlier results.

An analysis of data for the 20 largest U.S. cities from 1987-1994 from the NMMAPS study also reported that a linear model, without a threshold, was most appropriate for assessing the effects of particulate air pollution on daily mortality for total mortality and for mortality from cardiovascular and respiratory causes, but not for other causes of mortality. Daniels et al conclude: "...the continued demonstration of adverse effects of air pollution over recent decades, even as concentrations of pollutants have declined, suggests that exposures have not yet gone below no-effects thresholds, if such exist."

Schwartz, Joel and Zanobetti, Antonella. Using Meta-Smoothing to Estimate Dose-Response Trends across Multiple Studies, with Application to Air Pollution and Daily Death. *Epidemiology*, Vol. 11, No. 6, pp. 666-672, November 2000.

Daniels, M.J., Dominici, F., Samet, J.M., and Zeger, S.L. Estimating Particulate Matter-Mortality Dose-Response Curves and Threshold Levels: An Analysis of Daily Time-Series for the 20 Largest U.S. Cities. *American Journal of Epidemiology*, Vol. 152, No. 5, pp. 397-406, September 1, 2000.

#### EXPOSURE MEASUREMENT ERROR CRITICISM REFUTED

##### Air Quality Monitors Can Be Used to Track Exposure to Fine Particles

Epidemiological studies generally rely on centrally located air quality monitors to assess exposure to ambient air pollutants. Some have argued that these monitors do not represent actual exposures, because people spend a large portion of their day indoors.

A study by Dutch scientist Nicole Janssen et al., of 10 - 12 year old school children in Wageningen, The Netherlands compared personal exposure to fine particles with classroom concentrations, and with ambient measurements at an outdoor location. Researchers found that personal fine particle concentrations were highly correlated with ambient concentrations. This finding supports the use of ambient monitoring measurements as an indicator of exposure to fine particles in epidemiological time series studies.

Dr. David Mage, of U.S. EPA's Office of Research and Development, and colleagues, demonstrated that human exposure to fine particles of ambient origin is highly correlated in time to ambient PM concentrations measured at monitoring stations within the communities being studied.

The NMMAPS study discussed above also addressed the issue of measurement error, through the development of a model to systematically test what effect the relationship between personal exposure and ambient exposure might have on the observed increase in mortality associated with PM. While data to test the model is limited, "theoretical and actual analyses generated appear to refute the criticisms that exposure measurement error could explain the associations between PM and adverse health effects."

Janssen, N.A.H., Hoek, G., Nusselder, H., and Brunekreef, B. Personal Exposure to Fine Particles in Children Correlates Closely with Ambient Fine Particles. *Archives of Environmental Health*, March/April 1999, Vol. 54, No. 2, 95-101.

Mage, D., Wilson, W., Hasselblad, V., Grant, L. Assessment of Human Exposure to Ambient Particulate Matter. *J. Air & Waste Manage. Assoc.* 49:1280-1291, Nov. 1999.

Zeger, S.L., Thomas, D., Dominici, F., Samet, J.M., Schwartz, J., Dockery, D.W., and Cohen, A. Exposure Measurement Error in Time-Series Studies of Air Pollution. In: *The National Morbidity, Mortality, and Air Pollution Study, Part I: Methods and Methodologic Issues*. HEI Research Report 94, May 2000.

##### Criteria for Asserting Causality Have Been Met

In responding to an article by Dr. John Gamble, Epidemiologist for Exxon Biomedical Sciences, Dr. David Bates, Professor Emeritus of Medicine at University of British Columbia, has re-evaluated the recent evidence health evidence regarding particulate matter and mortality. Determination of causality does not rest on any one study. Instead, a weight of evidence approach is used to evaluate the scientific literature across a series of criteria such as coherence, consistency, strength of association, temporality, analogy, and biologic plausibility. Dr. Bates asserts that all of these criteria have been met by an avalanche of new data that strengthen the case for a causal relationship.



Bates, D.V. Lines that Connect: Assessing the Causality Inference in the Case of Particulate Pollution. *Environ Health Perspect* 108: 91-92, 2000.

Gamble, John F. PM<sub>2.5</sub> and Mortality in Long-term Prospective Cohort Studies: Cause-Effect or Statistical Associations? *Environ Health Perspect* 106:533-549 (1998).

Kuzzli, N. and Tager, I.B. Comments on "PM<sub>2.5</sub> and Mortality in Long-term Prospective Cohort Studies: Cause-Effect or Statistical Associations?" and Gamble, John. Reply to Kuzzli and Tager Regarding Causality in PM<sub>2.5</sub> Cohort Studies. *Environ Health Perspect* 107:5, 1999; Correspondence.

#### People With Pre-Existing Cardiac or Respiratory Conditions Have Higher Than Average Risk of Death from Exposure to Particles

Canada's national health insurance system enables access to detailed health records of patients. This permitted Dr. Mark Goldberg and colleagues at McGill University to conduct a detailed analysis of particle pollution and mortality in Montreal. Investigators were able to link individual deaths in Montreal to medical information up to five years before death. These data were used in conjunction with clinical expertise to define susceptible subgroups at risk of premature death from several different measures of particulate pollution. Subjects with acute lower respiratory disease, congestive heart failure, and a combination of cardiovascular diseases died at higher rates for increases in each of the three particulate matter measures. Associations with coefficient of haze and predicted PM<sub>2.5</sub> were reported for subjects with cancer, chronic coronary artery disease, and coronary artery disease, while effects of sulfate were associated with acute and chronic upper respiratory disease.

Goldberg, M.S., Bailar, J.C. III, Burnett, R.T., Brook, J.R., Tamblin, R., Bonvalot, Y., Ernst, P., Flegel, K.M., Singh, R.K., and Valois, M-F. Identifying Subgroups of the General Population That May be Susceptible to Short-Term Increases in Particulate Air Pollution: A Time-Series Study in Montreal, Quebec. Health Effects Institute, Research Report Number 97, October 2000.

#### "Coarse" Particles are Also Linked with Disease and Death

This study by Dr. Morton Lippmann and colleagues from the New York University School of Medicine attempted to identify components of particulate matter and other air pollution mixtures that were associated with excess daily deaths and hospital admissions of the elderly in the Detroit metropolitan area. Investigators reported that deaths from respiratory diseases were associated with PM<sub>10</sub> and total suspended particulates. Unexpectedly, they found that relative risks for PM<sub>10-2.5</sub>, the coarse particle fraction, were similar to those for PM<sub>2.5</sub>, and even higher in the case of ischemic heart disease and stroke. The authors conclude that *"the finding of elevated and significant effects for PM<sub>10-2.5</sub> suggests that there may still be a rationale to consider the health effects of the coarse fraction as well as the fine fraction of PM."*

Lippmann, M., Ito, K., Nadas, A., and Burnett, R.T. Association of Particulate Matter Components with Daily Mortality and Morbidity in Urban Populations. Health Effects Institute Research Report Number 95, August 2000.

#### BIOLOGIC MECHANISMS AND CARDIAC EFFECTS

##### Air Pollution Tied to Low Heart Rate Variability, a Risk Factor for Heart Attacks

Particulate air pollution has been linked to cardiovascular mortality in a number of studies, but the mechanisms for this effect are not well understood. Recent research centers on the effect of pollution on heart rate and heart rate variability. Low heart rate variability is a marker of poor cardiac control by the autonomic nervous system, and is associated with a higher risk of heart attacks and sudden cardiac death. One hypothesis is that inhalation of particle air pollution may trigger an inflammatory response in the lung, followed by the release of chemical mediators that affect autonomic nervous system control of the heart beat.

Pope, et al. measured oxygen saturation and pulse rate in a panel of 90 elderly residents of the Utah Valley, using a small medical device known as an oximeter. The experiment was conducted during the winter months, when PM concentrations are highest. Researchers found little evidence of pollution effects on the oxygen carrying capacity of the blood, but observed that a small elevation in pulse rate was associated with a rise in PM<sub>10</sub> levels. The medical and biological relevance of this effect is unclear.

Dr. Duanping Liao, of the University of North Carolina, and co-investigators, conducted daily electrocardiogram measurements on elderly nursing home residents outside Baltimore, Maryland. Harvard physician Dr. Diane Gold et al. studied 53- to 87- year old active residents of Boston. 25 minutes of electrocardiogram measurements during different exercise states were taken on a weekly basis. Both the Baltimore and Boston studies found that elevated concentrations of fine particulate matter were associated with lower heart rate variability, and that the association was stronger for people with pre-existing cardiovascular conditions.

Pope, C.A., Dockery, D.W., Kanner, R.E., Villegas, G.M., and Schwartz, J. Oxygen Saturation, Pulse Rate, and Particulate Air Pollution: A Daily Time-Series Panel Study. *Am J Respir Crit Care Med* 1999; 159:363-372.

Liao, D., Creason, J., Shy, C., Williams, R., Watts, R., and Zweidinger, R. Daily Variations of Particulate Air Pollution and Poor Cardiac Autonomic Control in the Elderly. *Environ Health Perspect* 107:521-525 (1999).

Gold, D.R., Litonjua, A., Schwartz, J., Lovett, E., Larson, A., Nearing, B., Allen, G., Verrier, M., Cherry, R., and Verrier, R. Ambient Pollution and Heart Rate Variability. *Circulation* 2000; 101:1267.

Stone, P.H. and Gudleski J.J. First Steps Toward Understanding the Pathophysiologic Link Between Air Pollution and Cardiac Mortality. *Am Heart J* 1999; 138:803-7.

##### Increased Heart Rate and Plasma Viscosity During an Air Pollution Episode Suggest Possible Mechanisms

The World Health Organization Monitoring Survey of Trends and Determinants in Cardiovascular Disease (the "MONICA" survey) took place in Augsburg, in Southern Germany during the winter of 1984-1985. Over 4,000 randomly selected adults

participated, and received electrocardiograms to measure their resting heart rate, and donated blood samples to measure plasma viscosity. Electrocardiograms were administered again in 1987-1988.

In January 1985, an air pollution episode occurred throughout central Europe, with elevated concentrations of sulfur dioxide, total suspended particulates, and carbon monoxide. During the air pollution episode, higher heart rates were observed for men and women, after adjusting for cardiovascular risk factors and weather. An elevated resting heart rate is a risk factor for death and fatal heart disease, and may signal changes in the autonomic control of the heart, that might partially account for the adverse health effects observed in association with air pollution.

One hypothesis is that increased plasma viscosity might lead to constricted blood flow in the heart (ischemia), which can be fatal in people with severe coronary heart disease. During the air pollution episode, increases in plasma viscosity were observed, and persisted after adjusting for other cardiovascular risk factors and weather. German researcher Annette Peters, et al. conclude that *"the increased plasma viscosity observed in these analyses of a cross-sectional survey might therefore represent a part of the pathophysiological chain linking high ambient air pollution to increased mortality and hospital admissions for cardiovascular diseases."*

An alternate hypothesis is proposed by Professor Anthony Seaton of the University of Aberdeen Medical School. He collected blood samples from 112 elderly people in two cities in the U.K. over an 18-month period, and examined various blood values in comparison to PM<sub>10</sub> concentrations. Based on the analysis, Seaton suggests that inhalation of some component of PM<sub>10</sub> may cause sequestration of red blood cells, which may explain the cardiovascular effects reported in other studies.

Peters, A., Perz, S., Doring, A., Steeber, J., Koenig, W., and Wichmann, H.E. Increases in Heart Rate During an Air Pollution Episode. *Am J Epidemiol* 1999; 150:1094-8.

Peters, A., Doring, A., Wichmann H.E., and Koenig, W. Increased Plasma Viscosity During an Air Pollution Episode: A Link to Mortality? *Lancet* 1997 May 31; 349(9065):1382-7.

Seaton, A., Soutar, A., Crawford, V., Elton, R., McNerlan, S., Cherris, J., Watt, M., Agius, R., Stout, R. Particulate Air Pollution and the Blood. *Thorax* 1999 Nov;54(11):1027-32.

#### Heart Patients Vulnerability to Potentially Fatal Arrhythmias Increases After Exposure to Air Pollution

A pilot study was designed to test the hypothesis that heart patients with a history of serious arrhythmia requiring implanted cardiac defibrillators experience potentially life-threatening arrhythmias following short term increases in air pollution. Defibrillators monitor electrical activity of the heart and initiate interventions such as pacing or shock therapy to restore a normal heartbeat. The devices record information on arrhythmic events.

One hundred heart patients in eastern Massachusetts were followed for a three-year period. The study found that a subgroup of these patients -- those with more than ten defibrillator events -- were most susceptible to pollution, with effects occurring one to two days after exposure. Among these patients, the strongest associations were with nitrogen dioxide, but positive associations were reported for PM<sub>10</sub> and PM<sub>2.5</sub> exposures as well.

Peters, A., Liu, E., Vermer, R.L., Schwartz, J., Gold, D.R., Mittleman, M., Baliff, J., Oh, J.A., Allen, G., Monahan, K., and Dockery, D.W. Air Pollution and Incidence of Cardiac Arrhythmia. *Epidemiology* 2000 Jan; 11(1):1-7.

#### Combustion Source Metals May Trigger Biologic Responses to Ambient Particulate Matter

Researchers have been trying to determine whether one component of particulate matter -- such as metals -- is responsible for the toxic effects. U.S. EPA investigators led by Dr. Daniel Costa obtained samples of particulate matter from oil and coal fly ash and ambient air from St. Louis, MO, Washington, DC, Dusseldorf, Germany, and Ottawa, Canada. The fly ash is rich in metal components such as iron, copper, nickel, vanadium, and zinc, as well as sulfate. Laboratory rats were instilled with PM samples from these sources, and lung cells were obtained via bronchoalveolar lavage and analyzed for signs of cell injury. Investigators found that the constituent metals and their bioavailability determine the acute inflammatory response of PM samples in lung tissue.

In a second experiment, rats were pretreated with a chemical intended to model certain disease conditions, namely inflammation of blood vessels and high blood pressure in the lungs. These animals were instilled with the fly ash samples, and lung cells were obtained for laboratory examination. After 96 hours of exposure, there was clear evidence of lung inflammation, however many of the test animals had died, apparently due to altered cardiac function. Survivors had increased electrocardiographic changes. Investigators hypothesize that soluble metals from PM mediate an array of injuries to the cardiopulmonary system of healthy and at-risk subjects.

Costa, D. L., and Dreher, K.L. Bioavailable Transition Metals in Particulate Matter Mediate Cardiopulmonary Injury in Healthy and Compromised Animal Models. *Environ Health Perspect* 105(Suppl 5): 1053-1060 (1997).

#### Laboratory Research on Dogs Suggests that PM May Harm People with Heart Disease

This toxicology study by Harvard pathologist Dr. John Godleski is one of the first to test whether exposure to particulate matter can change heart function in laboratory animals. Two groups of dogs were tested -- healthy dogs, and dogs with an induced coronary occlusion intended to simulate human coronary artery disease. Researchers exposed dogs to concentrated particles from the ambient Boston air. Both the normal and the compromised animals showed effects, but the clearest sign of PM effects was found in the dogs with the induced heart condition. The occluded animals were more susceptible

to serious arrhythmias when exposed to air pollution. The electrocardiogram signals for these dogs indicated more rapid development of ischemia, an inadequate flow of blood through the heart that can lead to a heart attack. Study reviewers concluded: *"this is a plausible and important mechanism to explain the association of increased cardiopulmonary mortality and exposure to particle pollution."*

Godleski, J.J., Verner, R.L., Koutrakis, P., and Catalano, P. Mechanisms of Morbidity and Mortality from Exposure to Ambient Air Particles. Health Effects Institute Research Report Number 91, February 2000

#### Concentrated Air Particles Induce Pulmonary Inflammation and Blood Changes in Humans

Effects of particles are showing up not only in laboratory animals, but also in a chamber study with human subjects performed by EPA research physician Dr. Andrew Ghio and colleagues. This controlled exposure study of young, healthy volunteers examined the effect of exposure to concentrated ambient particles from Chapel Hill, North Carolina. Volunteers alternated between moderate exercise and rest over a two-hour period in a chamber with high particle concentrations. No symptoms or decrements in pulmonary function were noted. However, eighteen hours after exposure, lung tissue had a higher concentration of neutrophils, a marker of inflammation. Blood work indicated a higher concentration of fibrinogen, which is a risk factor for clotting and heart attacks.

Ghio, A.J., Kim, C., and Devlin, R.B. Concentrated Ambient Air Particles Induce Mild Pulmonary Inflammation in Healthy Human Volunteers. In Press.

#### HOSPITAL AND EMERGENCY ROOM VISITS

##### Air Pollution May Account for Five Percent of Cardiac Hospital Admissions

Numerous studies have focused on mortality because it is an easy to measure effect for which data is readily available. It is important to note that early deaths represent just the tip of the iceberg of particulate related health effects. For each death, there are many more people admitted to the hospital, and for each hospital admission, many more visits to emergency departments and doctors offices. Similarly, for each patient who visits an emergency clinic, many more experience uncomfortable respiratory symptoms or days when they must restrict their activity, increase their use of medication, or remain indoors.

Increased hospital admission rates represent one of the most serious effects of air pollution. This study examined the association between PM<sub>10</sub>, carbon monoxide, and hospital admissions of the elderly for heart disease across eight urban counties with different pollution and weather profiles. The eight locations are: Chicago; Colorado Springs; New Haven; Minneapolis; St. Paul; Seattle; Spokane; and Tacoma. The study design was intended to minimize confounding by weather or other pollutants. Associations of both PM<sub>10</sub> and CO with cardiovascular hospital admissions were observed in areas with widely varying correlations between these pollutants and weather factors or other air pollutants. Overall, the results suggest that air pollution may be

responsible for five percent of hospital admissions for heart disease, representing an enormous public health impact.

Schwartz, Joel. Air Pollution and Hospital Admissions for Heart Disease in Eight U.S. Counties. Epidemiology 1999; 10:17-22.

##### Emergency Room Visits for the Respiratory Illness in the Elderly Linked to Air Pollution

Consistent with reports of aggravated symptoms in those with chronic respiratory conditions, a study in Montreal, Canada found strong associations between air pollution and emergency room visits for patients over 64 years of age during 1993, when more data were available. Positive associations were reported for ozone, PM<sub>10</sub>, PM<sub>2.5</sub>, and sulfate, at air pollution levels well below the U.S. air quality standards. The elderly are especially susceptible to the effects of air pollution.

The NMMAPS study, discussed above, reported strong and consistent associations between particulate air pollution and hospital admissions among the elderly for cardiovascular disease, pneumonia, and chronic obstructive pulmonary disease.

Defino, R.J., Murphy-Moulton, A.M., Bamer, R.T., Brook, J.R., and Becklake, M.R. Effects of Air Pollution on Emergency Room Visits for Respiratory Illnesses in Montreal, Quebec. Am J Respir Crit Care Med 1997; 155:568-576.

##### Pre-Existing Cardiovascular Disease Increases the Risk of PM-Related Hospital Admissions for Respiratory Causes

This ten-year study of Medicare patients in Chicago was designed to identify subgroups that are especially susceptible to particulate pollutions. Researchers examined records of previous hospital admissions and secondary diagnoses to determine whether people with certain conditions were predisposed to having a greater risk from air pollution. Investigators found that people with asthma had double the risk of a PM<sub>10</sub>-associated hospital admission, and that people with heart failure had double the risk of a PM<sub>10</sub>-induced COPD admission. The authors conclude, *"the results suggest that patients with acute respiratory infections or defects in the electrical control of the heart are a risk group for particulate matter effects."*

Zanobetti, A., Schwartz, J., and Gold, D. Are There Sensitive Subgroups for the Effects of Airborne Particles? Environmental Health Perspectives Vol. 108, No. 9, pp. 841-845, September 2000.

#### INFANT MORTALITY AND EFFECTS ON CHILDREN

##### Growth in Children's Lung Function is Slowed by Air Pollution

Researchers with the Children's Health Study led by the University of Southern California have monitored levels of major air pollutants in a dozen southern California communities since 1993, while tracking the respiratory health of more than 3,000 school age children. The twelve communities, which fell along a gradient of air pollution levels, were all within a 200-mile radius of Los Angeles. The California towns studied were Alpine, Atascadero, Lake Arrowhead, Lake Elsinore, Lancaster, Lompoc, Long Beach, Mira Loma, Riverside, San Dimas, Santa Maria, and Upland. In fourth-graders, significant deficits in growth of lung function were associated with various measures of fine particles (PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>10-2.5</sub>), nitrogen dioxide, and inorganic acid vapor, but not with ozone. The deficits were larger for children that spent more time outdoors. "This is the best evidence yet of a chronic effect of air pollution in children," said Dr. John Peters, University of Southern California professor of preventative medicine and one of the study authors. The study concluded that "the results suggest that exposure to air pollution may lead to a reduction in maximal attained lung function, which occurs early in adult life, and ultimately to increased risk of chronic respiratory illness in adulthood."

Gauderman, J.W., McConnell, R., Gilliland, F., London, S., Thomas, D., Avol, E., Vora, H., Berhane, K., Rappaport, E.B., Lurmann, F., Margolis, H.G., and Peters, J. Association between Air Pollution and Lung Function Growth in Southern California Children. *American Journal of Respiratory and Critical Care Medicine*, Vol. 162, pp 1383-1390, 2000.

#### Doctor Visits Climb In Relation to Air Pollution

In Paris, France, doctors still make house calls, and public records on the reason for the visits are available through the French national health insurance program. This enabled investigators to examine a significant but understudied health endpoint, doctor visits, that affects a much larger number of patients than those admitted to hospitals or treated in emergency departments of hospitals. The statistical model of daily air pollution effects used in this study controlled for season, pollen counts, influenza epidemics and weather. Medina et al. report that house calls for asthma for children 0-14 years old showed the strongest association with air pollution.

Medina, S., Le Tertre, A., Querel, P., Le Moules, Y., Lameiroise, P., Gazzo, J.C., Festy, B., Ferry, R., and Deb, W. Air Pollution and Doctors' House Calls: Results from the ERPUVS System for Monitoring the Effects of Air Pollution on Public Health in Greater Paris, France, 1991-1995. *Environmental Research* 75, 73-84, 1997.

#### Air Pollution May Contribute to Infant Mortality

A small but growing body of literature suggests that air pollution may contribute to infant mortality. British scientists Bobak and Leon analyzed infant mortality and several measures of long-term exposure to air pollutants in highly polluted regions of the Czech Republic. They found a consistent, positive association between PM<sub>10</sub> levels and post neonatal infant mortality from respiratory causes, after controlling for socioeconomic factors and other pollutants.

Dr. Dana Loomis, of the University of North Carolina, and co-workers found that air pollution is associated with acute increases in infant mortality in Mexico City after controlling for temperature and other factors. Increases in fine particles, ozone and nitrogen dioxide resulted in an increased number of infant deaths 3 to 5 days later. The effect of particles was the most consistent and the least sensitive to the presence of other pollutants.

A study by EPA scientist Dr. Tracey Woodruff et al., of 86 cities in the United States reported an association between infant mortality and the level of inhalable particles in the first two months of life.

Bobak, M. and Leon, D.A. The Effect of Air Pollution on Infant Mortality Appears Specific for Respiratory Causes in the Postneonatal Period. *Epidemiology* 1999;10:666-670.

Loomis, D., Castillejos, M., Cold, D.R., McDonnell, W., and Borya-Aburto, V.H. Air Pollution and Infant Mortality in Mexico City. *Epidemiology* 1999; 10:118-123.

Woodruff, T.J., Grilla, J., and Schoendorf, K.C. The Relationship Between Selected Causes of Postneonatal Infant Mortality and Particulate Air Pollution in the United States. *Environ Health Perspect* 1997; 105:607-612.

#### Air Pollution In Highly Polluted Regions May Cause Low Birth Weight Infants

Low birth weight is the most important predictor for neonatal mortality in developed and developing countries, and is a significant determinant of infant health and survival. A large study in Beijing, China looked at maternal exposure to air pollution during pregnancy and subsequent birth weight of infants. Coal stoves used for heating and cooking are a major source of indoor and outdoor air pollution in the study region. Xiaobin Wang of the Boston University School of Medicine and colleagues found a significant exposure-response relationship between maternal exposure to sulfur dioxide and total suspended particles during the third trimester of pregnancy and low birth weight.

Wang, X., Ding, H., Ryan, L., and Xu, X. Association Between Air Pollution and Low Birth Weight: A Community-Based Study. *Environ Health Perspect* (1997); 105:514-520.

#### ASTHMA EXACERBATION

##### Children's Emergency Room Visits for Asthma Increase on High Air Pollution Days

"Asthma is the most common chronic illness in children and the cause of most school absences," state Norris et al., in their study of children's emergency department visits for asthma. University of Washington investigators found significant associations between pediatric hospital visits for asthma and increased daily concentrations of PM and carbon monoxide in Seattle. Significantly, exacerbation of asthma was evident even when daily PM<sub>2.5</sub> concentrations were substantially below the level of the newly adopted National Ambient Air Quality Standard of 15 ug/m<sup>3</sup> annually.

In perhaps the largest study of pediatric asthma visits to date, Dr. Paige Tolbert, of the Rollins School of Public Health at Emory University, and co-investigators, obtained data on emergency department visits for three summers from seven large Atlanta area hospitals. The study included information on a variety of pollutants including spatial resolution of ozone data, a broad range of exposure levels, and a balanced distribution of socioeconomic status in the study population.

Increases in both ozone and particulate matter were found to heighten the risk of pediatric emergency room visits for acute asthma. According to the authors, "the study suggests continuing health risks at pollution levels that commonly occur in many U.S. cities," and "supports accumulating evidence regarding the relation of air pollution to childhood asthma exacerbation."

Normis, G., YoungPong, S.N., Koenig, J.Q., Larson, T.V., Sheppard, L., and Stout, J.W. An Association Between Fine Particles and Asthma Emergency Department Visits for Children in Seattle. *Environ Health Perspect* 107:489-493 (1999).

Tolbert, P.E., Melloholland, J.A., MacIntosh, D.D., Xu, F., Daniels, D., Devine, O.J., Cadin, B.P., Klein, M., Dorley, J., Butler, A.J., Nordenberg, D.F., Frunkin, H., Ryan, P.B., and White, M.C. Air Quality and Pediatric Emergency Room Visits for Asthma in Atlanta, Georgia. *Am J Epidemiol* 2000;151:798-810.

#### Children with Asthma are More Susceptible to Respiratory Effects

Increased particle concentrations have been associated with acute reductions in lung function and increased symptom reporting in children, including children with asthma. Dr. Sverre Vedal, Professor of Medicine at the University of British Columbia, and co-workers followed a group of 2,200 elementary school children in a pulp mill community on Vancouver Island, in Canada. Concentrations of potentially important copollutants such as sulfur dioxide, ozone, and acid aerosol were very low in the study community.

Vedal et al. found that children experience declines in peak expiratory flow, a measure of respiratory function, and increased symptoms such as cough, phlegm production, and sore throat, after increases in relatively low 24-hour PM<sub>10</sub> concentrations. Children with asthma were found to be more susceptible to these effects than other children.

Vedal, S., Pekau, J., White, R., and Blair, J. Acute Effects of Ambient Inhalable Particles in Asthmatic and Nonasthmatic Children. *Am J Respir Crit Care Med* 1998, Vol. 157, No. 4, 1034-1043.

#### Children's Asthma Symptoms Increase on High Pollution Days

This study followed a group of 133 children with mild to moderate asthma, ages 5-13, in the Seattle, Washington area. Daily reports of asthma symptoms were obtained from study diaries and compared with daily air pollution levels during 1994 and 1995.

Researchers found that a 30 percent increase in symptoms for each 10 µg/m<sup>3</sup> increase in PM<sub>10</sub> and an 18 percent increase in symptoms for a 10 µg/m<sup>3</sup> increase in PM<sub>10</sub>. Effects were also increased with carbon monoxide increases, which authors assume serves as a marker for vehicle exhaust. Study authors conclude: "These results for daily symptoms

complement the other Seattle-area studies that found air pollution health effects for emergency department visits and hospital admissions. Taken together, these studies suggest that the health effects among asthmatics from short-term changes in air pollution levels are an important public health problem."

Yu, O., Sheppard, L., Lumley, T., Koenig, J.Q., and Shapiro, G.G. Effects of Ambient Air Pollution on Symptoms of Asthma in Seattle - Area Children Enrolled in the CAMP Study. *Environmental Health Perspectives*, Vol. 108, No. 12, pp. 1209-1214, Dec. 2000.

#### Particulate Pollution Worsens Bronchitis in Asthmatic Children

A University of Southern California School of Medicine study of more than 3,600 fourth, seventh and tenth grade children relied on parent questionnaires to identify children with pre-existing asthma or wheeze, and to assess their bronchitic symptoms. The students lived in 12 communities in Southern California with a broad range of air pollution levels: Alpine; Atascadero; Lake Elsinore; Lake Gregory; Lancaster; Lompoc; Long Beach; Mira Loma; Riverside; San Dimas; Santa Maria; and Upland, California. Children with asthma were much more likely than other children to experience bronchitis and phlegm in relation to PM<sub>10</sub> exposures.

McConnell, R., Berhane, K., Gilliland, F., London, S.J., Vora, H., Avol, E., Gauderman, W.J., Margolis, H.G., Lutzmann, F., Thomas, D.C., and Peters, J.M. Air Pollution and Bronchitic Symptoms in Southern California Children with Asthma. *Environ Health Perspect* 107:757-766 (1999).

Peters, J.M., Evol, E., Navidi, W., London, S.J., Gauderman, W.J., Lutzmann, F., Linn, W.S., Margolis, H., Rappaport, E., Hong, J. Jr., and Thomas, D.C. A Study of Twelve Southern California Communities with Differing Levels and Types of Air Pollution; I. Prevalence of Respiratory Morbidity. *Am J Respir Crit Care Med* 1999; 159L:760-767.

Etzel, Ruth A. Research Highlights: Air Pollution and Bronchitic Symptoms in Southern California Children With Asthma. *Environ Health Perspect* Vol. 107, No. 9, September 1999.

#### Cleaning Up Air Pollution Improves the Respiratory Health of Children

A rather dramatic improvement in air quality in East Germany occurred following the German reunification in 1990. Researchers wanted to study if the declines in air pollution had produced a corresponding improvement in health, and they focused in on a cohort of first-, third-, and sixth-grade children in three East German communities. During the study period, bronchitis, ear infections, and frequent colds were dramatically reduced. Authors found that "the prevalence of nonasthmatic respiratory symptoms and diseases was higher in children living in more polluted communities, especially with respect to TSP and SO<sub>2</sub>, suggesting that disease occurrence may be reduced within a short period by improvement in air quality."

Heintoch, J., Haelscher, B., and Wichmann, H.E. Decline of Ambient Air Pollution and Respiratory Symptoms. *American Journal of Respiratory and Critical Care Medicine*, Vol. 161, pp. 1930-1936, 2000.

#### RECENT RISK ASSESSMENTS

#### Air Pollution from Power Plants Responsible for 30,000 Premature Deaths Each Year in U.S.

This analysis by Abt Associates used EPA-approved emissions and air quality modeling techniques to forecast ambient air quality in 2007, assuming full implementation of the Clean Air Act's acid rain control program, and the EPA's 1999 "NO<sub>x</sub> State Implementation Plan (SIP) call." Analysts then applied risk functions derived from epidemiological studies to estimate health impacts of power plant emissions in the U.S. The focus of the study was on gaseous emissions of sulfur dioxide and nitrogen oxides that are converted in the atmosphere to fine particle sulfates and nitrates. The analysis estimated that 30,100 deaths may be attributed to power plant emissions each year. In addition, power plant emissions causes 20,100 hospitalizations for respiratory and cardiovascular causes, more than 7,000 asthma-related emergency room visits, 18,600 cases of chronic bronchitis, 600,000 asthma attacks, over 5 million lost work days, and over 26 million minor restricted activity days. Reductions in emissions from uncontrolled power plants could substantially reduce the adverse health effects.

In addition, analysis used a simpler model to estimate the impacts of emissions from on- and off-road diesel engines. The analysis reported that 15,400 premature deaths each year are attributable to the diesel contribution to fine particle concentrations. In addition, there are an estimated 11,100 cases of chronic bronchitis due to diesel emissions, thousands of hospitalizations due to chronic obstructive pulmonary disease, pneumonia, asthma, and cardiovascular causes, and over a million cases of minor illness such as acute bronchitis, upper and lower respiratory symptoms, and asthma attacks. Because of the use of different models, these results are not directly comparable to the power plant estimates.

Abt Associates, Inc. with ICF Consulting, and E.H. Pechar Associates, Inc. Prepared for Clean Air Task Force. The Particulate-Related Health Benefits of Reducing Power Plant Emissions. October 2000.

#### Air Pollution Causes 40,000 Premature Deaths Each Year in Alpine Countries

As part of an assessment prepared for the World Health Organization, Nino Künzli and coauthors estimated health risk attributable to PM<sub>10</sub> pollution in three European countries, Austria, France, and Switzerland. Using functions of health risk obtained from epidemiological studies, the authors estimate that air pollution caused six percent of total mortality, or more than 40,000 cases each year, with about half associated with motor vehicle pollution. In addition, the study estimated that 47,000 new cases of chronic bronchitis in adults, more than 500,000 episodes of bronchitis in children, and more than a million asthma attacks are attributable to air pollution each year. Despite uncertainties inherent in risk assessment, this analysis highlights the magnitude of the public health burden attributable to current levels of air pollution.

Künzli, N., Kaiser, R., Medina, S., Studnicka, M., Chanel, O., Filliger, P., Herry, M., Horak, F. Jr., Paybommieux-Texier, V., Querol, P., Schneider, J., Seethader, J., Vergnaud, J.-C., and Sommer, H. Public Health Impact of Outdoor and Traffic-Related Air Pollution: A European Assessment. *The Lancet*, Vol. 356, pp. 795-801, September 2, 2000.

#### ORIGINAL CONTRIBUTION

## Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution

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**Context** Associations have been found between day-to-day particulate air pollution and increased risk of various adverse health outcomes, including cardiopulmonary mortality. However, studies of health effects of long-term particulate air pollution have been less conclusive.

**Objective** To assess the relationship between long-term exposure to fine particulate air pollution and all-cause, lung cancer, and cardiopulmonary mortality.

**Design, Setting, and Participants** Vital status and cause of death data were collected by the American Cancer Society as part of the Cancer Prevention II study, an ongoing prospective mortality study, which enrolled approximately 1.2 million adults in 1982. Participants completed a questionnaire detailing individual risk factor data (age, sex, race, weight, height, smoking history, education, marital status, diet, alcohol consumption, and occupational exposures). The risk factor data for approximately 500,000 adults were linked with air pollution data for metropolitan areas throughout the United States and combined with vital status and cause of death data through December 31, 1998.

**Main Outcome Measure** All-cause, lung cancer, and cardiopulmonary mortality.

**Results** Fine particulate and sulfur oxide-related pollution were associated with all-cause, lung cancer, and cardiopulmonary mortality. Each 10- $\mu\text{g}/\text{m}^3$  elevation in fine particulate air pollution was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively. Measures of coarse particle fraction and total suspended particles were not consistently associated with mortality.

**Conclusion** Long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality.

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fects of short-term exposures, several studies suggest that long-term exposure may be more important in terms of overall public health.<sup>1</sup> The new standards that would impose regulatory limits on fine particles measuring less than 2.5  $\mu\text{m}$  in diameter (PM<sub>2.5</sub>). These new standards were challenged by industry groups, blocked by a federal appeals court, but ultimately upheld by the US Supreme Court.<sup>2</sup>

Although most of the recent epidemiological research has focused on effects of short-term exposures, several studies linked individual risk factor and vital status data with national ambient air pollution data.<sup>3-6</sup> Our analysis uses data from the larger study and

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(1) doubles the follow-up time to more than 16 years and triples the number of deaths; (2) substantially expands exposure data, including gaseous copollutants and new  $PM_{10}$  data, which have been collected since the promulgation of the new air quality standards; (3) improves control of occupational exposures; (4) incorporates dietary variables that account for total fat consumption, and consumption of vegetables, citrus, and high-fiber grains; and (5) uses recent advances in statistical modeling, including the incorporation of random effects and nonparametric spatial smoothing components in the Cox proportional hazards model.

## METHODS

## Study Population

The analysis is based on data collected by the American Cancer Society (ACS) as part of the Cancer Prevention Study II (CPS-II), an ongoing prospective mortality study of approximately 1.2 million adults.<sup>13,14</sup> Individual participants were enrolled by ACS volunteers in the fall of 1982. Participants resided in all 50 states, the District of Columbia, and Puerto Rico, and were generally friends, neighbors, or acquaintances of ACS volunteers. Enrollment was restricted to persons who were aged 30 years or older and who were members of households without at least 1 individual aged 45 years or older. Participants completed a confidential questionnaire, which included questions about age, sex, weight, height, smoking history, alcohol use, occupational exposures, diet, education, marital status, and other characteristics.

Vital status of study participants was ascertained by ACS volunteers in September of the following years: 1984, 1986, and 1988. Reported deaths were verified with death certificates. Subsequently, through December 31, 1998, vital status was ascertained through automated linkage of the CPS-II study population with the National Death Index.<sup>15</sup> Ascertainment of deaths was more than 98% complete for the period of 1982-1988 and 93% complete after 1988.<sup>16</sup> Death certificates or codes

for cause of death were obtained for more than 98% of all known deaths. Cause of death was coded according to the *International Classification of Diseases, Ninth Revision (ICD-9)*. Although the CPS-II cohort included approximately 1.2 million participants with adequate questionnaire and cause-of-death data, our analysis was restricted to those participants who resided in US metropolitan areas with available pollution data. The actual size of the analytic cohort varied depending on the number of metropolitan areas for which pollution data were available. TABLE 1 provides the number of metropolitan areas and participants available for each source of pollution data.

## Air Pollution Exposure Estimates

Each participant was assigned a metropolitan area of residence based on address at time of enrollment and 3-digit ZIP code area.<sup>17</sup> Mean (SD) concentrations of air pollution for the metropolitan areas were compiled from various primary data sources (Table 1). Many of the particulate pollution indices, including  $PM_{10}$ , were available from data from the Inhalable Particle Monitoring Network for 1979-1983 and data from the National Aerometric Database for 1980-1981, periods just prior to or at the beginning of the follow-up period. An additional data source was the Environmental Protection Agency Aerometric Information Retrieval System (AIRS). The mean concentration of each pollutant from all available monitoring sites was calculated for each metropolitan area during the 1 to 2 years prior to enrollment.<sup>18</sup>

Additional information on ambient pollution during the follow-up period was extracted from the AIRS database as quarterly mean values for each routinely monitored pollutant for 1982 through 1998. All quarterly averages met summary criteria imposed by the Environmental Protection Agency and were based on observations made on at least 50% of the scheduled sampling days at each site. The quarterly mean values for all stations in each metro-

politan area were calculated across the study years using daily average values for each pollutant except ozone. For ozone, daily 1-hour maximums were used and were calculated for the full year and for the third quarter only (i.e., July, August, September). While gaseous pollutants generally had recorded data throughout the entire follow-up period of interest, the particulate matter monitoring protocol changed in the late 1980s from total suspended particulates to particles measuring less than 10  $\mu m$  in diameter ( $PM_{10}$ ), resulting in the majority of total suspended particulate data being available in the early to mid-1980s and  $PM_{10}$  data being mostly available in the early to mid-1990s.

As a consequence of the new  $PM_{10}$  standard, a large number of sites began collecting  $PM_{10}$  data in 1999. Daily  $PM_{10}$  data were extracted from the AIRS database for 1999 and the first 3 quarters of 2000. For each site, quarterly averages for each of the 2 years were computed. The 4 quarters were averaged when at least 1 of the 2 corresponding quarters for each year had at least 50% of the sixth-day samples and at least 45 total sampling days available. Measurements were averaged first by site and then by metropolitan area. Although no network of  $PM_{10}$  monitoring existed in the United States between the early 1980s and the late 1990s, the integrated average of  $PM_{2.5}$  concentrations during the period was estimated by averaging the  $PM_{2.5}$  concentration for early and later periods.

Mean sulfate concentrations for 1980-1981 were available for many cities based on data from the Inhalable Particle Monitoring Network and the National Aerometric Database. Recognizing that sulfate was artifactually overestimated due to glass fiber filters used at that time, season and region-specific adjustments were made.<sup>19</sup> Since few states analyzed particulate samples for sulfates after the early 1980s, individual states were directly contacted for data regarding filter use. Ion chromatography was used to analyze  $PM_{10}$  filters and this data could be obtained from metropolitan areas across the

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United States. Filters were collected for a single reference year (1990) in the middle of the 1982-1998 study period. The use of quartz filters virtually eliminated the historical overestimation of sulfate. Mean sulfate concentrations for 1990 were estimated using sulfate from AIRS data reported directly from individual states, and analysis of archived filters.

## Statistical Analysis

The basic statistical approach used in this analysis is an extension of the standard Cox proportional hazards survival

model,<sup>21</sup> which has been used for risk estimates of pollution-related mortality in previous longitudinal cohort studies.<sup>13,14</sup> The standard Cox model implicitly assumes that observations are statistically independent after controlling for available risk factors, resulting in 2 concerns with regard to risk estimates of pollution-related mortality.<sup>22</sup> First, if the assumption of statistical independence is not valid, the uncertainty in the risk estimates of pollution-related mortality may be misstated. Second, even after controlling for available risk factors, survival times of par-

ticipants living in communities closer together may be more similar than participants living in communities farther apart, which results in spatial autocorrelation. If this spatial autocorrelation is due to missing or systematically mismeasured risk factors that are spatially correlated with air pollution, then the risk estimates of pollution-related mortality may be biased due to inadequate control of these factors. Therefore, in this analysis, the Cox proportional hazards model was extended by incorporating a spatial random-effects component, which provided accurate es-

Table 1. Summary of Alternative Pollution Indices\*

Pollutant (Years of Data Collection)	Units	Source of Data	Data Compilation Team†	No. of Metropolitan Areas	No. of Participants, in Thousands	Mean (SD)
$PM_{2.5}$	$\mu g/m^3$					
1979-1983		IPMN	HEI	61	359	21.1 (4.6)
1989-2000		AIRS	NYU	118	800	14.0 (3.0)
Average				51	319	17.7 (3.7)
$PM_{10}$	$\mu g/m^3$					
1982-1998		AIRS	NYU	102	415	28.8 (5.9)
$PM_{2.5}$	$\mu g/m^3$					
1979-1983		IPMN	HEI	63	359	40.3 (7.7)
Total suspended particles	$\mu g/m^3$					
1979-1983		IPMN	HEI	63	359	19.2 (6.1)
1980-1981		NAD	HEI	158	590	68.0 (16.7)
1979-1983		IPMN	HEI	58	351	73.7 (14.3)
1982-1998		AIRS	NYU	150	673	56.7 (13.1)
Sulfate	$\mu g/m^3$					
1980-1981		IPMN and NAD, artifact adjusted	HEI	149	572	6.5 (2.8)
1990		Compilation and analysis of $PM_{10}$ filters	NYU	53	269	6.2 (2.0)
Sulfur dioxide	ppb					
1980		AIRS	HEI	118	520	9.7 (4.5)
1982-1998		NYU	NYU	126	539	6.7 (3.0)
Nitrogen dioxide	ppb					
1980		AIRS	HEI	78	402	27.9 (9.2)
1982-1998		NYU	NYU	101	493	21.4 (7.1)
Carbon monoxide	ppm					
1980		AIRS	HEI	113	519	1.7 (0.7)
1982-1998		NYU	NYU	122	536	1.1 (0.4)
Ozone	ppb					
1980		AIRS	HEI	174	569	47.9 (11.0)
1982-1998		NYU	NYU	119	525	45.5 (7.3)
1982-1998		NYU	NYU	134	557	59.7 (12.8)

\* $PM_{2.5}$  indicates particles measuring less than 2.5  $\mu m$  in diameter;  $PM_{10}$  indicates particles measuring less than 10  $\mu m$  in diameter;  $PM_{2.5-10}$  indicates particles measuring between 2.5 and 10  $\mu m$  in diameter;  $PM_{10}$  indicates particles measuring less than 10  $\mu m$  in diameter;  $PM_{2.5}$  indicates particles measuring less than 2.5  $\mu m$  in diameter;  $PM_{2.5-10}$  indicates particles measuring between 2.5 and 10  $\mu m$  in diameter;  $PM_{10}$  indicates particles measuring less than 10  $\mu m$  in diameter. †HEI, Inhalable Particle Monitoring Network; AIRS, Aerometric Information Retrieval System (Environmental Protection Agency); and NAD, National Aerometric Database. ‡Sulfate data were compiled by the Health Effects Institute from data which was previously published by the National Institute of Environmental Health Sciences (NIEHS) and the U.S. Environmental Protection Agency (EPA). §Values were calculated only for the third quarter (i.e., July, August, September).

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estimates of the uncertainty of effect estimates. The model also evaluated spatial autocorrelation and incorporated a nonparametric spatial smooth component (to account for unexplained spatial structure). A more detailed description of this modeling approach is provided elsewhere.<sup>22</sup>

The baseline analysis in this study estimated adjusted relative risk (RR) ratios for mortality by using a Cox proportional hazards model with inclusion of a metropolitan-based random-effects component. Model fitting involved a 2-stage process. In the first stage, survival data were modeled using the standard Cox proportional hazards model, including individual level covariates and indicator variables for each metropolitan area (without pollution variables). Output from stage 1 provided estimates of the metropolitan-specific logarithm of the RRs of mortality (relative to an arbitrary reference community), which were adjusted for individual risk factors. The correlation between these values, which was induced by using the same reference community, was then removed.<sup>23</sup> In the second stage, the estimates of adjusted metropolitan-specific health responses were related to fine particulate air pollution using a linear random-effects regression model.<sup>24</sup> The time variable used in the models was survival time from the date of enrollment. Survival times of participants who did not die were censored at the end of the study period. To control for age, sex, and race, all of the models were stratified by 1-year age categories, sex, and race (white vs other), which allowed each category to have its own baseline hazard. Models were estimated for all-cause mortality and for 3 separate mortality categories: cardiopulmonary (ICD-9 401-440 and 460-519), lung cancer (ICD-9 162), and all others.

Models were estimated separately for each of the 3 fine particle variables,  $PM_{2.5}$  (1979-1983),  $PM_{2.5}$  (1999-2000), and  $PM_{2.5}$  (average). Individual level covariates were included in the models to adjust for various important individual risk factors. All of these

variables were classified as either indicator (ie, yes/no, binary, dummy) variables or continuous variables. Variables used to control for tobacco smoke, for example, included both indicator and continuous variables. The smoking indicator variables included: current cigarette smoker, former cigarette smoker, and a pipe or cigar smoker only (all vs never smoking) along with indicator variables for starting smoking before or after age 18 years. The continuous smoking variables included: current smoker's years of smoking, current smoker's cigarettes per day, current smoker's years of smoking squared, current smoker's cigarettes per day squared, former smoker's years of smoking, former smoker's years of smoking squared, former smoker's cigarettes per day, former smoker's cigarettes per day squared, and the number of hours per day exposed to passive cigarette smoke.

To control for education, 2 indicator variables, which indicated completion of high school or education beyond high school, were included. Marital status variables included indicator variables for single and other vs married. Both body mass index (BMI) values and BMI values squared were included as continuous variables. Indicator variables for beer, liquor, and wine drinkers and nonsmokers vs non-drinkers were included to adjust for alcohol consumption. Occupational exposure was controlled for using various indicator variables: regular occupational exposure to asbestos, chemicals/acids/solvents, coal or stone dusts, coal tar/pitch/asphalt, diesel engine exhaust, or formaldehyde, and additional indicator variables that indicated 9 different rankings of an occupational dirtiness index that has been developed and described elsewhere.<sup>25</sup> Two diet indices that accounted for fat consumption and consumption of vegetables, citrus, and high-fiber grains were derived based on information given in the enrollment questionnaire.<sup>26</sup> Quintile indicator variables for each of these diet indices were also included in the models.<sup>18</sup>

In addition to the baseline analysis, several additional sets of analysis were conducted. First, to more fully evaluate the shape of the concentration-response function, a robust locally weighted regression smoother<sup>26</sup> (within the generalized additive model framework<sup>27</sup>) was used to estimate the relationship between particulate air pollution and mortality in the second stage of model fitting. Second, the sensitivity of the fine particle mortality risk estimates compared with alternative modeling approaches and assumptions was evaluated. Standard Cox proportional hazards models were fit to the data including particulate air pollution as a predictor of mortality and sequentially adding (in a controlled forward stepwise process) groups of variables to control for smoking, education, marital status, BMI, alcohol consumption, occupational exposures, and diet.

In addition, to evaluate the sensitivity of the estimated pollution effect while more aggressively controlling for spatial differences in mortality, a 2-dimensional term to account for spatial trends was added to the models and was estimated using a locally weighted regression smoother. The "span" parameter, which controls the complexity of the surface smooth, was set at 3 different settings to allow for increasingly aggressive fitting of the spatial structure. These included a default span of 50%, the span that resulted in the lowest unexplained variance in mortality rate between metropolitan areas, and the span that resulted in the strongest evidence (highest *P* value) to suggest no residual spatial structure. The risk estimates and SEs (and thus the confidence intervals) were estimated using generalized additive modeling<sup>27</sup> with S-Plus statistical software,<sup>28</sup> which provides unbiased effect estimates, but may underestimate SEs if there is significant spatial autocorrelation and significant correlations between air pollution and the smoothed surface of mortality. Therefore, evidence of spatial autocorrelation was carefully evaluated and tested using the Bartlett test.<sup>29</sup> The correlations of residual mortality

## MORTALITY AND LONG-TERM EXPOSURE TO AIR POLLUTION

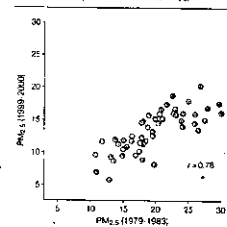
with distance between metropolitan areas were graphically examined.

Analyses were also conducted of effect modification by age, sex, smoking status, occupational exposure, and education. Finally, models were fit using a variety of alternative pollution indices, including gaseous pollutants. Specifically, models were estimated separately for each of the pollution variables listed in Table 1, while also including all of the other risk factor variables.

## RESULTS

Fine particulate air pollution generally declined in the United States during the follow-up period of this study. Figure 1 plots mean  $PM_{2.5}$  concentrations for 1999-2000 over mean  $PM_{2.5}$  concentrations for 1979-1983 for the

Figure 1. Mean Fine Particles Measuring Less Than 2.5  $\mu m$  in Diameter ( $PM_{2.5}$ )



Mean  $PM_{2.5}$  concentrations in micrograms per meter cubed for 1999-2000 are plotted along with concentrations for 1979-1983 for the 51 metropolitan areas with paired pollution data. The dotted line is a reference 45° equality line.

Table 2. Adjusted Mortality Relative Risk (RR) Associated With a 10- $\mu g/m^3$  Change in Fine Particles Measuring Less Than 2.5  $\mu m$  in Diameter

Cause of Mortality	Adjusted RR (95% CI)*		
	1979-1983	1999-2000	Average
All-cause	1.04 (1.01-1.06)	1.06 (1.02-1.10)	1.05 (1.02-1.11)
Cardiopulmonary	1.06 (1.02-1.10)	1.08 (1.02-1.14)	1.07 (1.02-1.10)
Lung cancer	1.08 (1.01-1.16)	1.13 (1.04-1.23)	1.14 (1.04-1.23)
All other cause	1.01 (0.97-1.05)	1.01 (0.97-1.06)	1.01 (0.95-1.06)

\*Estimated and adjusted based on the baseline random-effects Cox proportional hazards model, controlling for age, sex, race, smoking, education, BMI, marital status, body mass, alcohol consumption, occupational exposure, and diet (CI indicates confidence interval).

51 cities in which paired data were available. The concentrations of  $PM_{2.5}$  were lower in 1999-2000 than in 1979-1983 for most cities, with the largest reduction observed in the cities with the highest concentrations of pollution during 1979-1983. Mean  $PM_{2.5}$  levels in the 2 periods were highly correlated ( $r=0.78$ ). The rank ordering of cities by relative pollution levels remained nearly the same. Therefore, the relative levels of fine particle concentrations were similar whether based on measurements at the beginning of the study period, shortly following the study period, or an average of the 2.

As reported in Table 2, all 3 indices of fine particulate air pollution were associated with all-cause, cardiopulmonary, and lung cancer mortality, but not mortality from all other causes combined. Figure 2 presents the nonparametric smoothed exposure response relationships between cause-specific mortality and  $PM_{2.5}$  (average). The log RRs for all-cause, cardiopulmonary, and lung cancer mortality increased across the gradient of fine particulate matter. Goodness-of-fit tests indicated that the associations were not significantly different from linear associations ( $P>.20$ ).

The fine particle mortality RR ratios from various alternative modeling approaches and assumptions are presented in Figure 3. After controlling for smoking, education, and marital status, the controlled forward stepwise inclusion of additional covariates had little influence on the estimated associations with fine particulate air pollution on cardiopulmonary and lung cancer mortality. As expected, cigarette smoking was highly significantly associated with el-

evated risk of all-cause, cardiopulmonary, and lung cancer mortality ( $P<.001$ ). Estimated RRs for an average current smoker (men and women combined, 22 cigarettes/day for 33.5 years, with initiation before age 18 years) were equal to 2.58, 2.89, and 14.80 for all-cause, cardiopulmonary, and lung cancer mortality, respectively. Statistically significant, but substantially smaller and less robust associations, were also observed for education, marital status, BMI, alcohol consumption, occupational exposure, and diet variables. Although many of these covariates were also statistically associated with mortality, the risk estimates of pollution-related mortality were not highly sensitive to the inclusion of these additional covariates.

Figure 3 also demonstrates that the introduction of the random-effects component to the model resulted in larger SEs of the estimates and, therefore, somewhat wider 95% confidence intervals. There was no evidence of statistically significant spatial autocorrelation in the survival data based on the Bartlett test ( $P>.20$ ) after controlling for fine particulate air pollution and the various individual risk factors. Furthermore, graphical examination of the correlations of the residual mortality with distance between metropolitan areas did not reveal significant spatial autocorrelation (results not shown). Nevertheless, the incorporation of spatial smoothing was included to further investigate the robustness of the estimated particulate pollution effect. Effect estimates were not highly sensitive to the incorporation of spatial smoothing to account for regional clustering or other spatial patterns in the data.

Figure 4 presents fine particle air pollution-related mortality RR ratios after stratifying by age, sex, education, and smoking status, and adjusting for all other risk factors. The differences across age and sex strata were not generally consistent or statistically significant. However, a consistent pattern emerged from this stratified analysis: the association with particulate pollution was stronger for both cardiopulmo-



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nary and lung cancer mortality for participants with less education. Also, for both cardiopulmonary and lung cancer mortality, the RR estimates were higher for nonsmokers.

FIGURE 5 summarizes the associations between mortality risk and air pollutant concentrations listed in Table 1. Statistically significant and relatively consistent mortality associations existed for all measures of fine particulate exposure, including  $PM_{2.5}$  and sulfate particles. Weaker less consistent mortality associations were observed with  $PM_{10}$  and  $PM_{10-2.5}$ . Measures of the coarse particle fraction ( $PM_{10-2.5}$ ) and total suspended particles were not consistently associated with mortality. Of the gaseous pollutants, only sulfur dioxide was associated with elevated mortality risk. Interestingly, measures of  $PM_{2.5}$  were associated with all-cause cardiopulmonary and lung cancer mortality, but not with all other mortality. However, sulfur oxide pollution (as measured by sulfate particles and/or sulfur dioxide) was significantly associated with mortality from all other causes in addition to all-cause, cardiopulmonary, and lung cancer mortality.

## COMMENT

This study demonstrated associations between ambient fine particulate air pollution and elevated risks of both cardiopulmonary and lung cancer mortality. Each  $10\text{-}\mu\text{g}/\text{m}^3$  elevation in long-term average  $PM_{2.5}$  ambient concentrations was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively, although the magnitude of the effect somewhat depended on the time frame of pollution monitoring. In addition, this analysis addresses many of the important questions concerning the earlier, more limited analysis of the large CPS-II cohort, including the following issues.

First, does the apparent association between pollution and mortality persist with longer follow-up and as the cohort ages and dies? The present analysis more than doubled the follow-up time to more than 16 years, resulting

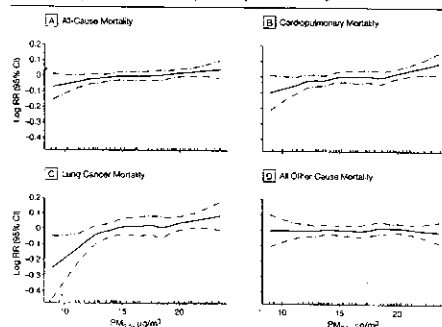
in approximately triple the number of deaths, yet the associations between pollution and mortality persisted.

Second, can the association between fine particulate air pollution and increased cardiopulmonary and lung cancer mortality be due to inadequate control of important individual risk factors? After aggressively controlling for smoking, the estimated fine particulate pollution effect on mortality was remarkably robust. When the analysis was stratified by smoking status, the estimated pollution effect on both cardiopulmonary and lung cancer mortality was strongest for never smokers vs former or current smokers. This analysis also controlled for education, marital status, BMI, and alcohol consumption. This analysis used improved variables to control for occupational exposures and incorporated diet variables that accounted for total fat consumption, as well as for consumption of vegetables, citrus, and high-fiber grains. The mortality associations with fine particulate air pollution were largely unaffected by the inclusion of these indi-

vidual risk factors in the models. The data on smoking and other individual risk factors, however, were obtained directly by questionnaire at time of enrollment and do not reflect changes that may have occurred following enrollment. The lack of risk factor follow-up data results in some misclassification of exposure, reduces the precision of control for risk factors, and constrains our ability to differentiate time dependency.

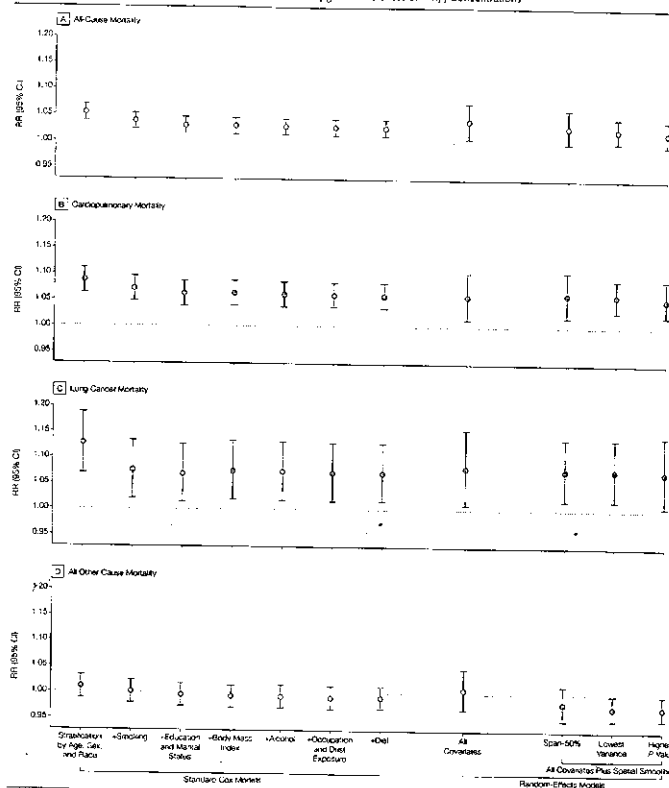
Third, are the associations between fine particulate air pollution and mortality due to regional or other spatial differences that are not adequately controlled for in the analysis? If there are unmeasured or inadequately modeled risk factors that are different across locations, then spatial clustering will occur. If this clustering is independent or random across metropolitan areas, then the spatial clustering can be modeled by adding a random-effects component to the Cox proportional hazards model as was done in our analysis. The clustering may not be independent or random across metropolitan areas due to inadequately measured or modeled

Figure 2. Nonparametric Smoothed Exposure Response Relationship



Vertical lines along x-axis indicate lag or frequency plots of mean fine particulate pollution ( $PM_{2.5}$ ), mean fine particles measuring less than  $2.5\text{ }\mu\text{m}$  in diameter (RR, relative risk; and CI, confidence interval).

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Figure 3. Mortality Relative Risk (RR) Ratio Associated With  $10\text{-}\mu\text{g}/\text{m}^3$  Differences of  $PM_{2.5}$  Concentrations

Data presented are for 1979–1993 for the different causes of death, with various levels of controlling for individual risk factors, and using alternative modeling approaches. The 3 models with spatial smoothing allow for increasing aggressive testing of the spatial structure. Plus sign indicates model included previous variables (ie, smoking included stratification by age, sex, and race);  $PM_{2.5}$ , mean fine particles measuring less than  $2.5\text{ }\mu\text{m}$  in diameter; and CI, confidence interval.

## MORTALITY AND LONG-TERM EXPOSURE TO AIR POLLUTION

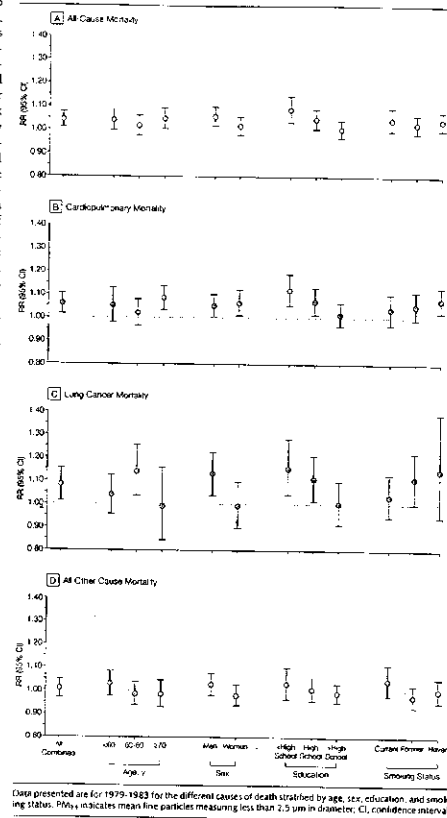
risk factors (either individual or ecological). If these inadequately measured or modeled risk factors are also spatially correlated with air pollution, then biased pollution effects estimates may occur due to confounding. However, in this analysis, significant spatial autocorrelation was not observed after controlling for fine particulate air pollution and the various individual risk factors. Furthermore, to minimize any potential confounding bias, sensitivity analyses, which directly modeled spatial trends using nonparametric smoothing techniques, were conducted. A contribution of this analysis is that it included the incorporation of both random effects and nonparametric spatial smoothing components to the Cox proportional hazards model. Even after accounting for random effects across metropolitan areas and aggressively modeling a spatial structure that accounts for regional differences, the association between fine particulate air pollution and cardiopulmonary and lung cancer mortality persists.

Fourth, is mortality associated primarily with fine particulate air pollution or is mortality also associated with other measures of particulate air pollution, such as  $PM_{10}$ , total suspended particles, or with various gaseous pollutants? Elevated mortality risks were associated primarily with measures of fine particulate and sulfur oxide pollution. Coarse particles and gaseous pollutants, except for sulfur dioxide, were generally not significantly associated with elevated mortality risk.

Fifth, what is the shape of the concentration-response function? Within the range of pollution observed in this analysis, the concentration-response function appears to be monotonic and nearly linear. However, this does not preclude a leveling off (or even steepening) at much higher levels of air pollution.

Sixth, how large is the estimated mortality effect of exposure to fine particulate air pollution relative to other risk factors? A detailed description and interpretation of the many individual risk factors that are controlled for in the analysis goes well beyond the scope of

Figure 4. Adjusted Mortality Relative Risk (RR) Ratio Associated With 10- $\mu g/m^3$  Differences of  $PM_{2.5}$  Concentrations

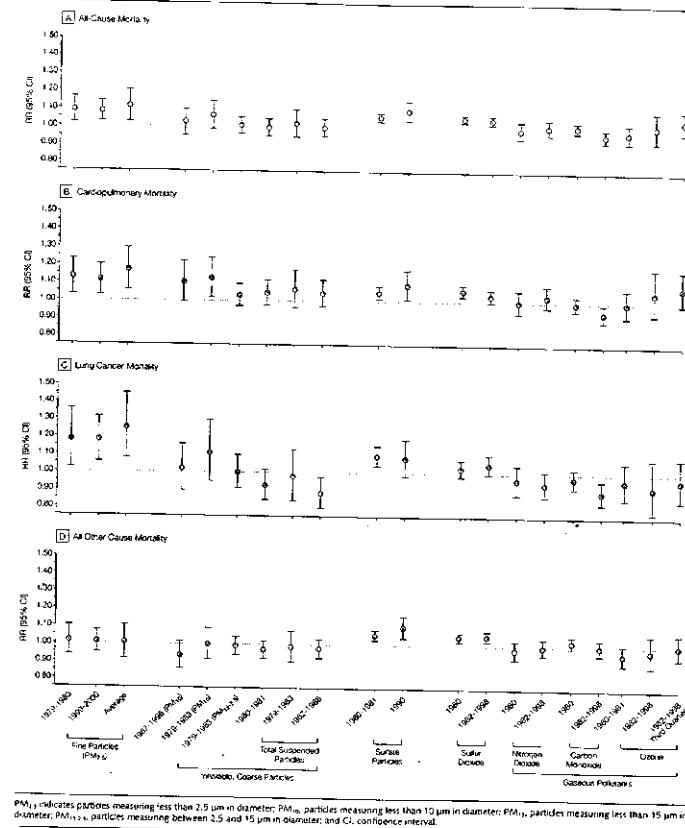


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Figure 5. Adjusted Mortality Relative Risk (RR) Ratio Evaluated at Subject-Weighted Mean Concentrations



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this report. However, the mortality risk associated with cigarette smoking has been well documented using the CPS-II cohort.<sup>16</sup> The risk imposed by exposure to fine particulate air pollution is obviously much smaller than the risk of cigarette smoking. Another risk factor that has been well documented using the CPS-II cohort data is body mass as measured by BMI.<sup>17</sup> The World Health Organization has categorized BMI values between 18.5-24.9 kg/m<sup>2</sup> as normal; 25-29.9 kg/m<sup>2</sup>, grade 1 overweight; 30-39.9 kg/m<sup>2</sup>, grade 2 overweight; and 40 kg/m<sup>2</sup> or higher, grade 3 overweight.<sup>18</sup> In the present analysis, BMI values and BMI values squared were included in the proportional hazards models. Consistent with previous ACS analysis,<sup>19</sup> BMI was significantly associated with mortality, optimal BMI was between approximately 23.5 and 24.9 kg/m<sup>2</sup>, and the RR of mortality for different BMI values relative to the optimal were dependent on sex and smoking status. For example, the RRs associated with BMI values between 30.0 and 31.9 kg/m<sup>2</sup> (vs optimal) would be up to approxi-

mately 1.33 for never smokers. Based on these calculations, mortality risks associated with fine particulate air pollution at levels found in more polluted US metropolitan areas are less than those associated with substantial obesity (grade 3 overweight), but comparable with the estimated effect of being moderately overweight (grade 1 to 2).

In conclusion, the findings of this study provide the strongest evidence to date that long-term exposure to fine particulate air pollution common to many metropolitan areas is an important risk factor for cardiopulmonary mortality. In addition, the large cohort and extended follow-up have provided an unprecedented opportunity to evaluate associations between air pollution and lung cancer mortality. Elevated fine particulate air pollution exposures were associated with significant increases in lung cancer mortality. Although potential effects of other unaccounted for factors cannot be excluded with certainty, the associations between fine particulate air pollution and lung cancer mortality, as well as cardiopulmonary mortality, are

observed even after controlling for cigarette smoking, BMI, diet, occupational exposure, other individual risk factors, and after controlling for regional and other spatial differences.

**Author Contributions:** Study concept and design: Pope, Burnett, Krewski, Thurston. Acquisition of data: Thur, Cate, Krewski, Ilia, Thurston. Analysis and interpretation of data: Pope, Burnett, Krewski, Thurston. Drafting of the manuscript: Pope, Burnett, Ilia, Thurston. Critical revision of the manuscript for important intellectual content: Pope, Thur, Cate, Krewski, Thurston. Administrative, technical, or material support: Pope, Cate, Krewski, Ilia, Thurston.

**Study supervision:** Pope, Krewski. **Obtained funding:** Pope, Thur, Thurston. **Administrative, technical, or material support:** Pope, Cate, Krewski, Ilia, Thurston.

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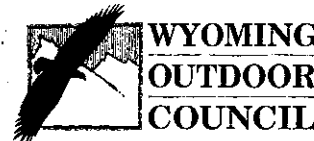
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Winter Use Draft SEIS Comments  
Grand Teton and Yellowstone National Parks  
P.O. Box 352  
Moose, Wyoming 83012

May 28, 2002

To Whom It May Concern:

The Wyoming Outdoor Council ("WOC") and its approximately 1000 members appreciate the opportunity to comment on the Winter Use Supplemental Environmental Impact Statement (SEIS).

Founded by Wyoming residents in 1967, today WOC is the state's oldest and largest independent statewide conservation organization. WOC works to ensure the wise management and protection of Wyoming's public lands, including our national forests, parks refuges and lands administered by the Bureau of Land Management. WOC fulfills our mission to protect and enhance Wyoming's environment by educating and involving citizens and advocating environmentally sound public policies and decisions.

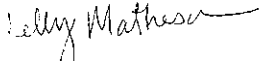
With respect to the Winter Use in Grand Teton and Yellowstone National Parks, WOC has actively participated in the planning process since the initial scoping period commenting with the Greater Yellowstone Coalition (GYC) throughout the process, sending out alerts to our membership, and educating the public on the issue. After thoughtful review of the supplemental analysis, we echo the concerns set forth by the Greater Yellowstone Coalition (GYC) in its comment letter dated May 29th, 2002 and incorporate GYC's substantive comments by reference. We ask that Grand Teton and Yellowstone National Parks consider and incorporate the concerns set forth in GYC's comment letter of May 29, 2002 into the supplemental analysis. We also ask that the Park Service protect the wildlife, natural ecosystems, and beauty of Grand Teton and Yellowstone National Parks by selecting **Alternative 1a** as the preferred alternative.

Yellowstone and Grand Teton National Parks not only serve as strongholds for our country's most majestic wildlife but they also serve as crown jewels for wilderness travelers and recreationalists throughout the world. We must take care of the land in such a way that the beauty and original character of the parks might be preserved.

Given the importance of these national parks we urge you to thoroughly and rigorously consider the comments set forth in GYC's letter. We also urge you to listen to the American public

divesting yourself from the special interests of the snowmobile industry on this very significant issue. American tradition is at stake. Please protect our parks.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kelly Matheson".

Kelly Matheson  
Greater Yellowstone Program Coordinator  
(307) 332-7031 ext. 20